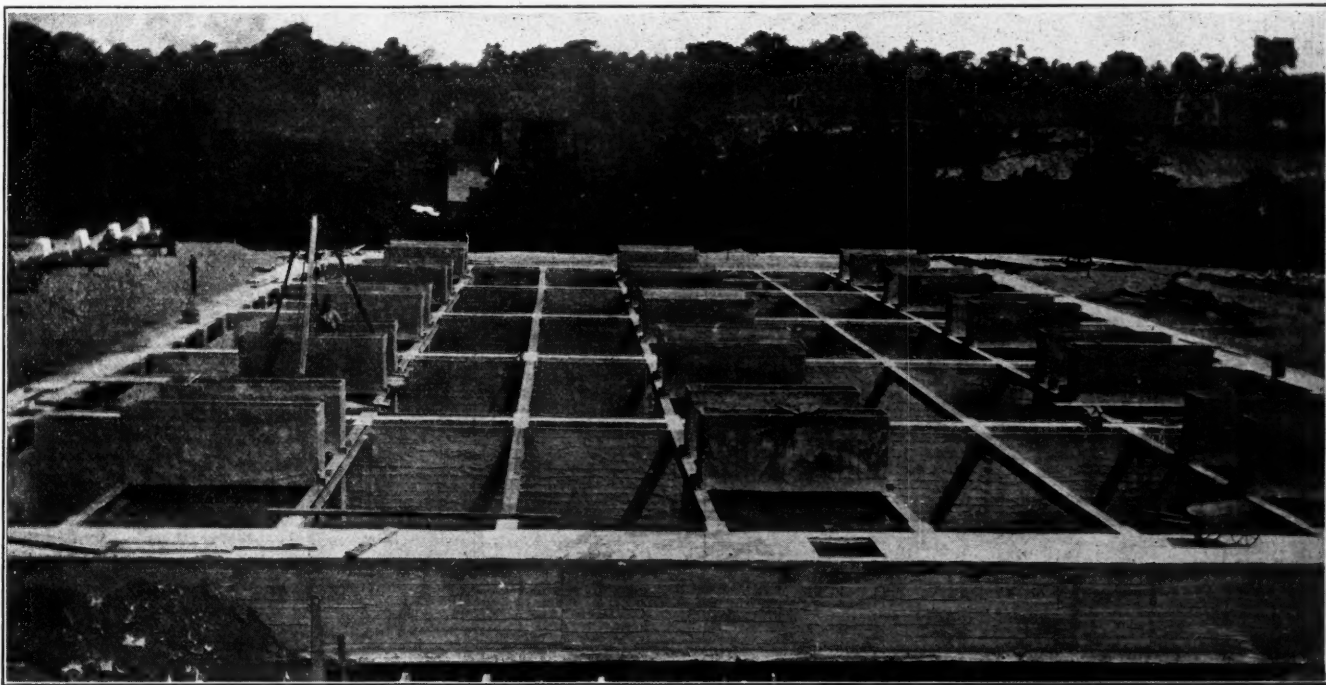


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No. 12



FITCHBURG IMHOFF TANKS PARTIALLY COMPLETED.

FITCHBURG SEWAGE DISPOSAL PLANT

Imhoff Settling Tanks, Sprinkling Filters and Secondary Settling Tanks—Capacity About Five Million Gallons a Day—New Features in Imhoff Tank Construction—Detail Plans and Contract Prices.

The new sewage disposal plant of Fitchburg, Mass., is nearing completion and will probably be put in active service late this fall. Studies and plans for the plant were made during 1912 and 1913 by D. A. Hartwell, engineer in charge. Work was started early in 1913 by R. H. Newell Co. and N. S. Brock, the contractors. The bid was \$209,027.40. The contract provides that the work be completed before April 30, 1915.

The plant consists of five rectangular settling tanks of the Imhoff type, two acres of sprinkling filters, four circular secondary settling tanks, and about four-tenths acre of sludge drying beds. Other necessary work included the erection of a laboratory building, straightening and improving the channel of the Nashua River, constructing a half mile of macadam roadway, a pump and building for handling the sludge, and about 3,000 feet of 6-inch water pipe.

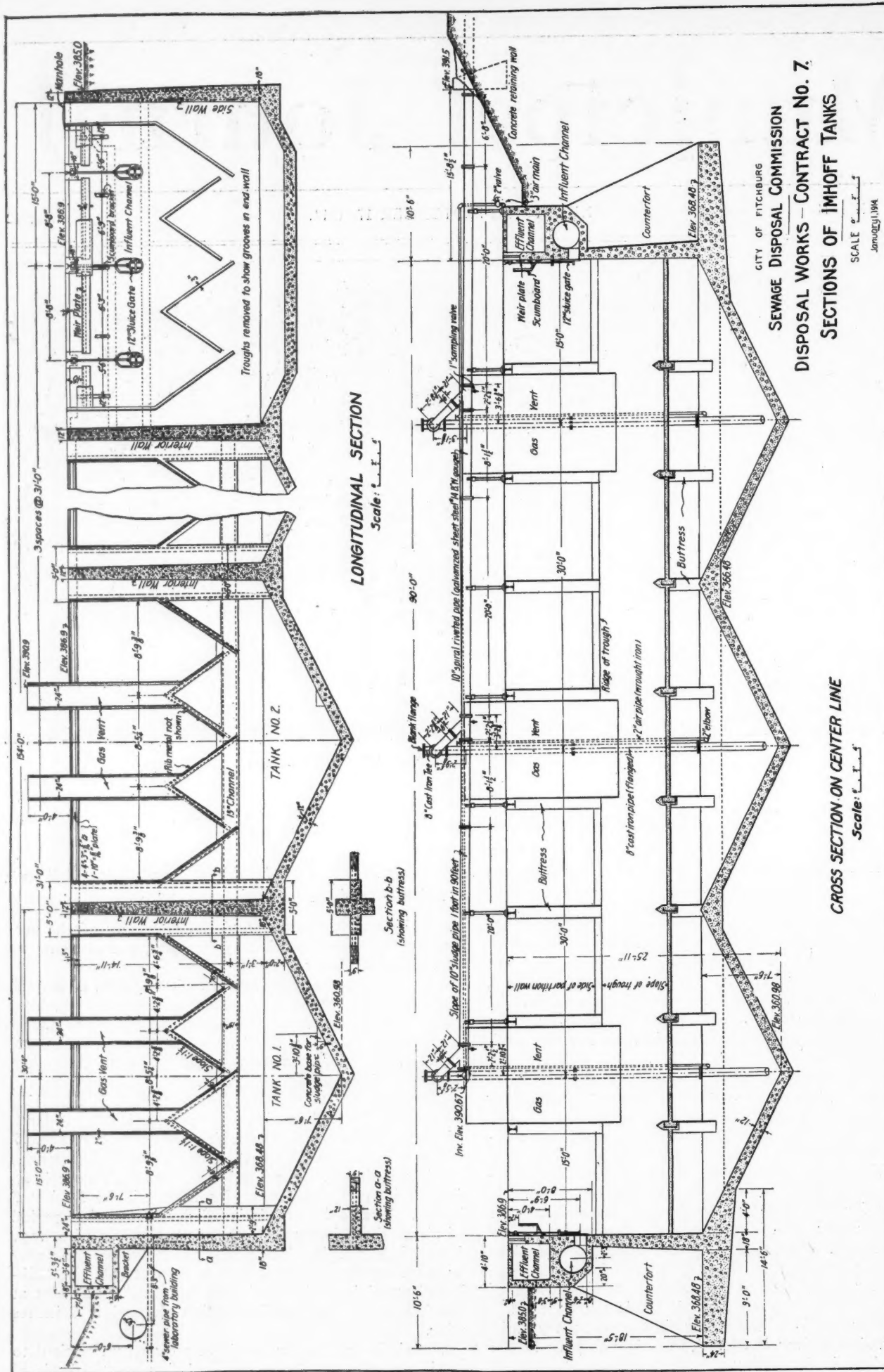
The location and general layout of the disposal plant are such that the sewage flows by gravity from one stage to another and finally to the river. The elevation of the sewage in the Imhoff tanks is 385.4; that of the top of the filter is 375; of the sewage in the secondary tanks is 360 and the river is 343. The only pumping in the whole plant is for lifting the sludge from the Imhoff

tanks by compressed air and the emptying of the secondary tanks for cleaning by pumping the contents up to the Imhoff tanks.

The sewage, after passing through a syphon of 30-inch cast iron pipe a mile long, passes through a 30-inch by 15-inch Venturi meter just before reaching the tanks, the amount being recorded on a chart by an automatic register. From the meter the sewage passes through a 30-inch Y into the Imhoff tanks.

The tanks are rectangular in shape, each 31 feet wide and 90 feet long. The side walls are vertical for a depth of 18 feet 5 inches, below which are hopper bottoms 7 feet 6 inches deep. Each tank has three such bottoms, making 15 in all. The total depth of each tank is 25 feet 11 inches; the depth of sewage will be 24 feet 5 inches. The tanks are designed for a retention period of about three hours with the probable flow of sewage from 55,000 people. The sloping bottoms of the upper or sedimentation compartments are constructed of "Rib-Truss" metal lath plastered with "Gunite." The slot at the bottom of each sedimentation channel is 6 inches wide.

The sludge compartments have a capacity sufficient to retain six months' sludge accumulation, on the basis of

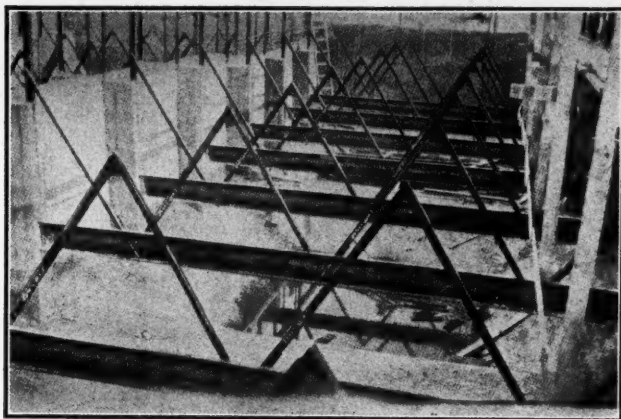


CITY OF FITCHBURG
SEWAGE DISPOSAL COMMISSION
DISPOSAL WORKS - CONTRACT NO. 7.
SECTIONS OF IMHOFF TANKS

SCALE 1" = 1'-0"
January 1944

CROSS SECTION ON CENTER LINE
Scale: 1" = 1'-0"

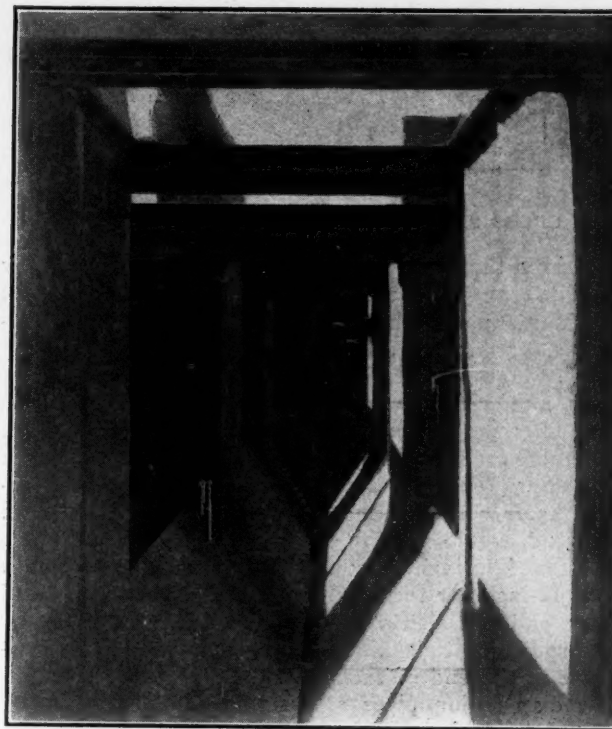
IMHOFF TANKS—LONGITUDINAL AND CROSS-SECTION.



IMHOFF TANK DURING CONSTRUCTION.

.007 cubic foot of sludge per capita per day. The influent and effluent conduits are so arranged with sluice gates and stop planks that the direction of flow can be reversed to secure a more uniform deposit of sludge in the three bottoms of each tank. The main walls of the tanks are constructed of reinforced concrete, supported by structural steel frames. Provision is made so that any one of the five tanks can be emptied while the others are in service.

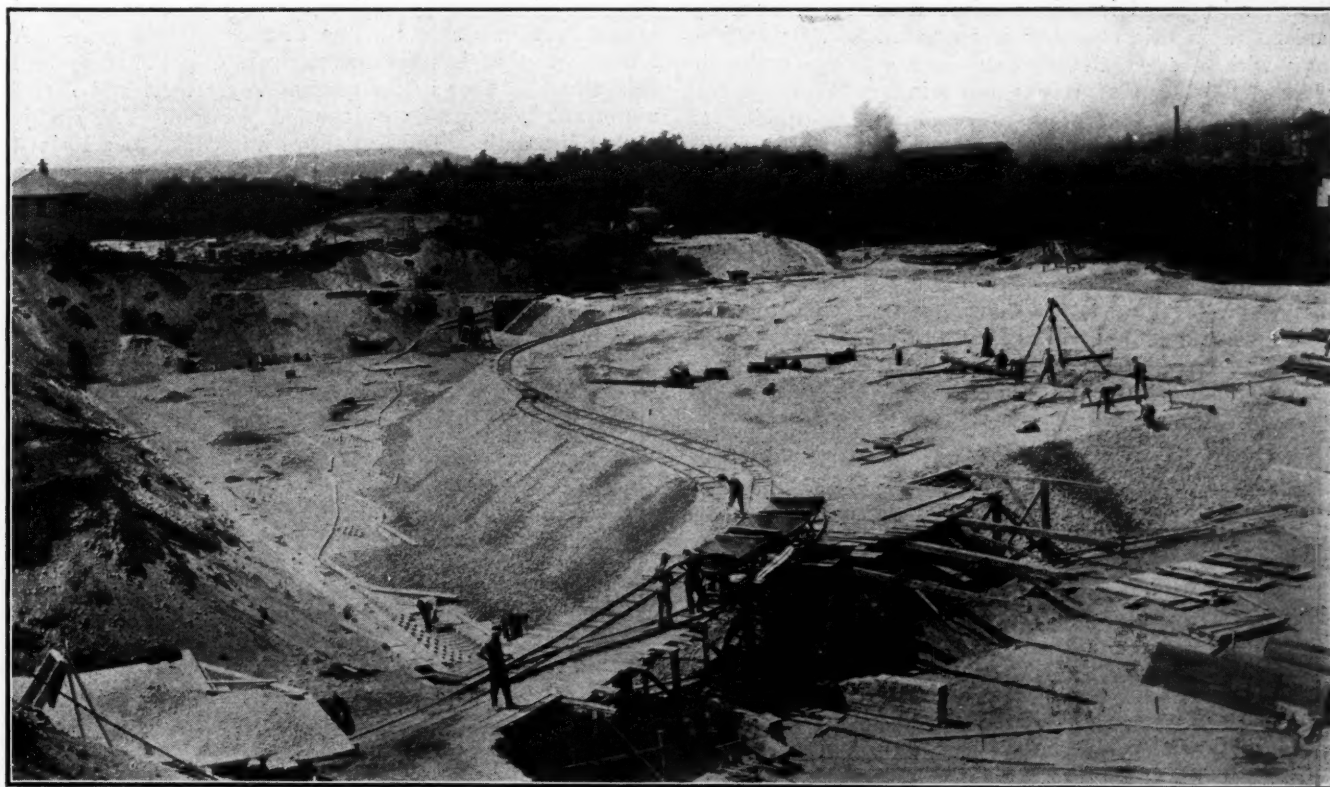
From the Imhoff tanks the effluent will pass over weirs and through two 30-inch cast iron dosing siphons installed in dosing tanks. These siphons will automatically regulate the flow of sewage onto the filters. The filters are 223 feet by 405 feet and are designed to care for the sewage of about 40,000 people. The floor is made of concrete with Clinton wire reinforcement, having troughs or channels with curved section 3 inches deep and 11 inches in span. The thickness of concrete under the deepest part is 3 inches. Over these channels are placed brick made of one part cement to two parts stone crusher dust, 17 inches long, $1\frac{1}{8}$ inches thick and 4 inches deep. The bricks are placed on edge spanning the channels so that those over each channel overlap those on the



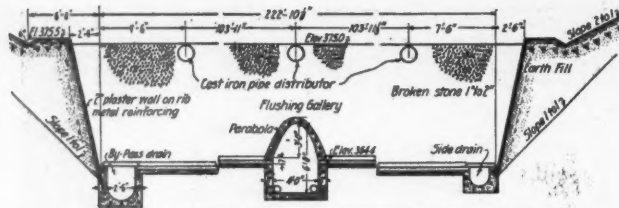
INTERIOR OF IMHOFF TANK, SHOWING SLOT.

adjacent channels 2 inches, thus keeping all bricks properly spaced. This form of floor construction gives about 40 per cent of air space and is expected to increase the efficiency of the filter. Over these bricks is laid a layer of 2-inch cobblestones about 3 inches deep and on top of these is placed the broken stone, which is laid 10 feet deep. Both local granite and trap rock have been used, in sizes from one to two inches.

Through the center of the filter, covering a length of 405 feet, is built a flushing gallery with a port hole to each channel to allow for such inspection and flushing as may be necessary. The channels have a slope of 6



PLACING STONE IN SPRINKLING FILTER.



CROSS SECTION OF SPRINKLING FILTER.

inches from the inspection gallery to the drains on either side of the filter. A cast iron main connected with the city water supply is laid in the gallery, with hose connections for flushing the channels.

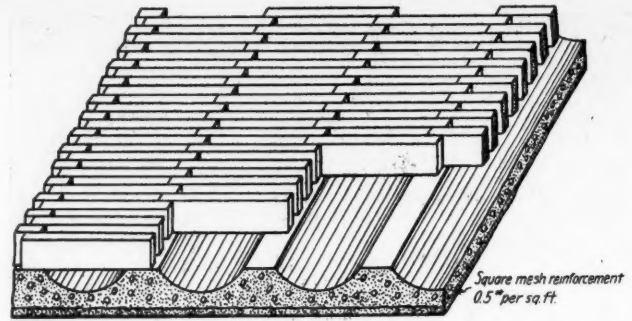
The sewage is distributed through a header line of 30-inch and 36-inch cast iron pipe, located at the end of the filter nearest the Imhoff and dosing tanks, from which there are seventeen lines of pipe running the length of the filter. There is a gate for each line, so that in ordinary repair work only one line, covering one-seventeenth of the bed, would need to be put out of service. These lines are of 16-inch cast iron pipe for half the length and of 12-inch for the balance. Hatch boxes are placed at each end and also at the reducer, thus providing for easy inspection or cleaning. There is also a 6-inch blow-off gate at the end of each line.

The distribution pipes are laid in the broken stone, with the tops of the pipes at the surface of the stone. There is no other support for the pipes. The sprinkling nozzles, which will be screwed directly into the pipes without the use of any risers, will be located at the apexes of equilateral triangles, 15 feet on each side. The type of nozzle to be used is the modified Worcester, this style having been adopted after exhaustive tests by Frank W. Jones, chemist for the city.

The filter beds are built largely in excavation and, to prevent the sand and gravel from working into the filter, a curtain wall of rib metal lath, covered with mortar by a cement gun, is used. This wall is about 2 inches thick.

At the lower end of the filter beds the drains from them unite into a 30-inch concrete conduit, which carries the effluent to the secondary tanks. An overflow chamber is placed in this conduit near the secondary tanks and in this chamber is an overflow weir 25 feet long with a crest elevation 10 inches above the weir crest of the secondary tanks and 8 inches below the top of the tanks. This weir prevents any possibility of overflowing the tanks or of the backing up of the effluent from the sprinkling filters. In this chamber provision is made also for by-passing the filter effluent to the river without passing it through the secondary tanks.

The secondary tanks are circular in form, 30 feet in internal diameter with vertical side walls 14 feet 9 inches high. The bottoms are inverted cones with a depth of 9 feet 3 inches. The depth of liquid in the



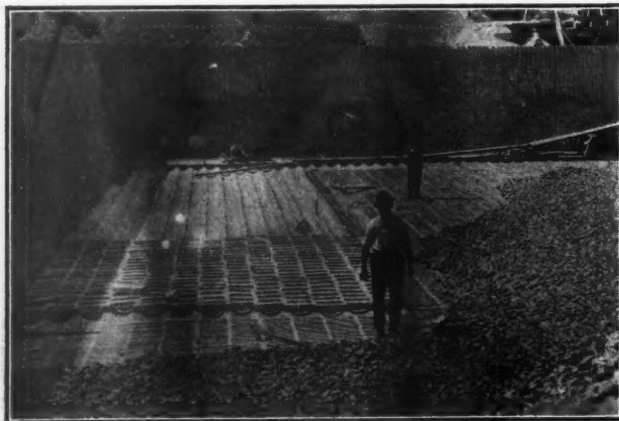
ISOMETRIC VIEW OF FLOOR

SPRINKLING FILTER FLOOR DRAINAGE.

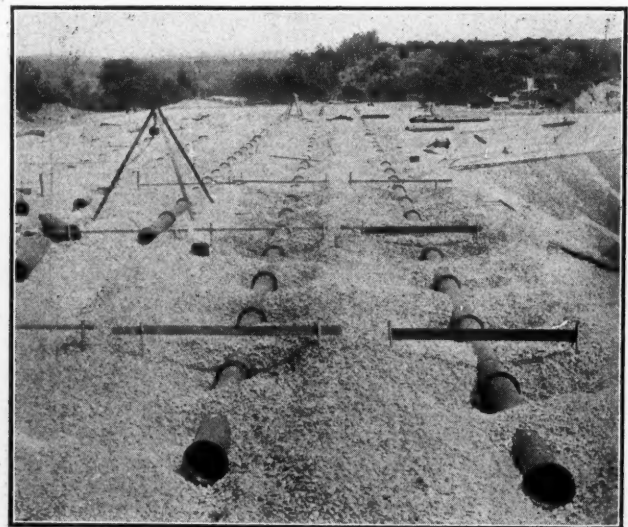
tanks will be 22 feet 9 inches. The tanks are built of reinforced concrete and in the center of each is placed a steel pipe 5 feet in diameter and 12 feet long. The filter effluent enters each tank through a 16-inch pipe connecting the 30-inch effluent conduit with the 5-foot vertical pipe in the tank, and flows downward and out through the lower end of this pipe. Each tank has 24 weirs, each 2 feet long, over which the liquid flows into the effluent channel, which is located within and at the outer circumference of the tank. The effluent then flows down a flight of concrete steps into an open channel and thence into the river. The tanks are designed for a retention period of 1 hour on the basis of the sewage flow from 55,000 persons.

The sludge deposit in these secondary tanks is likely to be of such a character as to create an objectionable odor if dried on beds, and provision is therefore made to pump all the contents of any tank up to the Imhoff tanks, where the sludge will be mixed with crude sewage sludge. The pumping will be done by a centrifugal motor-driven pump.

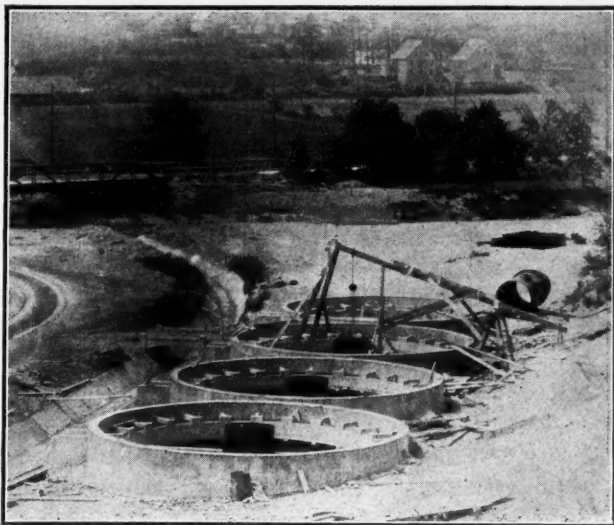
As the gas contained in the sludge is an aid to drying, the sludge will not be pumped from the Imhoff tanks but will be ejected by the air left principle in order to avoid breaking up the sludge and losing the gas. An eight-inch cast iron pipe is erected in the center of each of the 15 inverted pyramidal bottoms of the tanks and is continued up through one of the two gas vents. A 2-inch wrought iron compressed air pipe connects into this about 17 feet below normal water level and 7 feet above the bottom of the inverted pyramid. The sludge will be lifted about 8½ feet above water level to a 10-inch sludge pipe having a slope of 1 foot in 90, through which it will flow to the beds by gravity. It is expected that the sludge will contain about 90 per cent of water.



FLOOR CONSTRUCTION OF SPRINKLING FILTER.



SPRINKLING FILTER—LAYING DISTRIBUTING PIPES.



SECONDARY SETTLING TANKS.

The sludge drying area, which is located adjacent to the Imhoff tanks but about 3 feet higher in elevation, is divided into 11 beds, each 15 feet wide and 111 feet long. Two-inch plank 12 inches wide is used to divide the beds. Each bed will be provided with a narrow gauge track on which cars will be run for removing the dried sludge. The area of the beds is based on the allowance of one square foot for 3 persons. Sludge will be applied to the depth of 8 inches. The sandy and gravelly soil of which the beds are composed makes it unnecessary to provide underdrains. It is possible that experiments will be conducted to ascertain the possibility of using the sludge for agricultural purposes.

The plans for the disposal plant as approved by the State Board of Health provide for passing the effluent from the secondary tanks through sand filters. The present construction does not include such filters for the reason that possibly that effluent can be turned directly into the river without further treatment; but if not, suitable rapid filters can be located just below the secondary tanks, receiving the effluent from them by gravity.

A building 33 feet 8 inches by 43 feet 8 inches and two stories high contains laboratories, a general office, a stock room, cement listing room and workmen's room. The first floor contains one room each for general laboratory, bacteriological laboratory and water analysis laboratory and a general office. The basement contains a workmen's room, cement listing room, stock room, boiler room and a room for the air compressor for pumping the sludge from the Imhoff tanks.

In all the concrete work Lehigh Portland cement was used. Considerable excavation had to be done and for this work a Bucyrus steam shovel was employed. Most of the stone used was local granite obtained from a quarry about one and a half miles away, which was hauled by Alco 4-ton trucks. When working at full speed these trucks make 11 trips per day, carrying $3\frac{1}{2}$ cubic yards per trip. The 4 trucks might therefore theoretically haul 924 yards per week, but experience has shown that they average less than 700 yards. Each trip requires 45 minutes. They are loaded by a chute but in unloading 5

minutes are wasted in backing up a long incline. The daily expenses for the trucks are:

17 gallons gasoline @ 16c.....	\$2.72
$\frac{3}{4}$ gallon oil @ 32c.....	.24
Chauffeur, 9 hours @ 40c.....	3.60
Repairs, tires and night watchman.....	2.00
Depreciation (per day, estimated).....	5.00

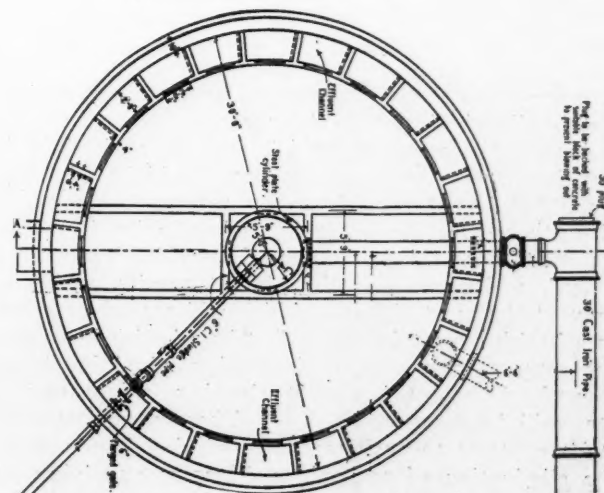
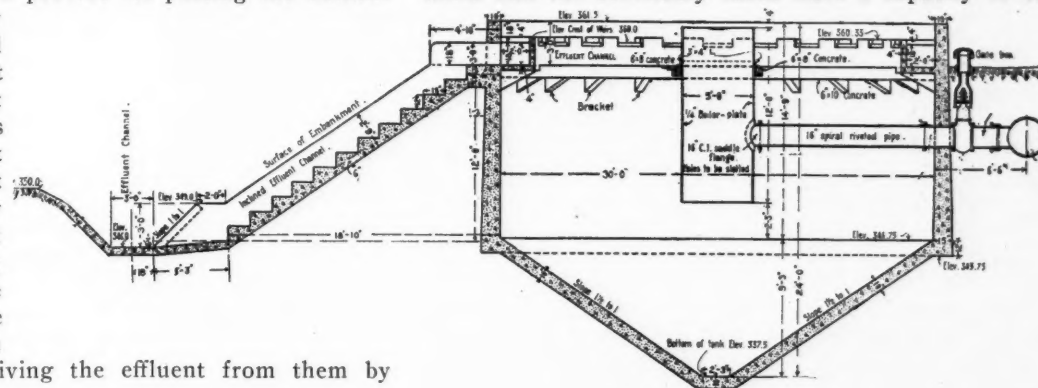
Total cost per day.....\$13.56

The average haul is 115 cubic yards for $1\frac{1}{2}$ miles, or an average of 172 yards-miles per day at a cost of \$13.56 or a little less than 8 cents a yard-mile.

In all there are to be 34,000 cubic yards of stone in the sprinkling filters. Most of the local stone is screened to remove the large amount of dust in it, as are also exceptionally dirty cars of the trap, of which some is used for the filter construction.

Some of the more important contract prices on this work are as follows: Earth excavation for Imhoff tanks, 42 cts.; for sprinkling filters and sludge beds, 29 cts.; for secondary tanks, 85 cts.; for effluent and river channels, 42 cts. Concrete for Imhoff, secondary and dosing tanks, \$11.50; for sprinkling filters, \$11.00; for main filter drain, \$10; miscellaneous, Class A, \$15; Class B, \$6. Cement plaster on rib metal, \$1.75 per square yard. Broken stone for sprinkling filters, \$1.95 per cu. yd. Sprinkling filter floor, \$2.60 per sq. yd. Laboratory building, \$11,500. In all, the work was divided into 68 items for bidding.

It is not thought that any part of the disposal plant, with the exception of the sprinkling filters, will have to be enlarged before 1935. The filter area will care for 40,000 population and the city is expected to attain this size by 1920. Additional filters can be built at any time, however, as there is plenty of ground available. The Imhoff tanks and the secondary tanks have a capacity to care



SECONDARY SETTLING TANK, PLAN AND SECTION.



SLUDGE DRYING BED UNDER CONSTRUCTION.

for 55,000 people, and there is room for adding more units of these also when they are needed.

The Sewage Disposal Commission consists of Arthur H. Lowe, chairman, David M. Dillon and Daniel A. Boyle. The chief engineer is David A. Hartwell, and Harrison P. Eddy, of Metcalf & Eddy, is consulting engineer. Mr. Hartwell is also superintendent of sewers of the city.

MODERN SANITARY FALLACIES.

In a paper before the Conference of Mayors of New York State on June 5, Dr. Donald B. Armstrong, superintendent of the Bureau of Public Health and Hygiene of New York City, discussed "Public Health Values; A Few Modern Sanitary Fallacies." In this paper he made as his principal point that cities all over the country were appropriating money for health or sanitary purposes, a large part of which was spent in ways which, however desirable they might be for other reasons, from the point of view of sanitation, were not the most advantageous.

For instance, Auburn, N. Y., appropriated for health \$12,320 in 1913 and spent 57 per cent of it on garbage removal. In 1911, New York City's Department of Health spent more on sanitary inspection than it did on milk inspection. Other instances were cited by Dr. Armstrong which showed that he considered inspection and control of a city's milk supply as being far more important from a health point of view than almost anything else. "This is an age in which the mass of people are exceedingly enthusiastic and to some degree hysterical about health," said the author, who believed that in their enthusiasm they have taken up, and are spending a great amount of energy and money on, certain fads and fancies which produce very inadequate results relative to what might be obtained should these be directed into more profitable channels. "It is very pleasing to have garbage removed, and it is not very decent to have it lie around, but the removal or non-removal of it has very little influence on our morbidity or mortality rates."

"There is no doubt that a great deal of relative over-emphasis is placed on sanitary surveys, sanitary clean-ups, etc." Not that these things are not desirable, but "an expenditure that is made for the preservation of decency or for the enforcement of honest methods should not be disguised as a health measure."

Among the measures which may be properly called health measures, moreover, there should be wise selection. "It is not possible to do them all at once, and since there must be a selection of activities, it is essential that those things be done first which are most required, which promise the biggest results, which will prevent the most sickness, which will act most strongly as a health conserving agent." "As a health investment, the returns from sanitary inspection, plumbing inspection, food inspection, street cleaning, refuse removal, etc., will be meagre. * * * These measures are in strict contrast to such measures of vital importance as the elimination of contagious diseases; supplying milk free from tuberculosis, typhoid, dysentery and diph-

theria; the manufacture and administration of diphtheria antitoxin, smallpox and typhoid vaccines; the development of vital statistics; the encouragement of sanitary research, etc."

As to pure food regulations, the author states that very little injury to health results from preservatives, adulterations, cold storage, or almost any other of the treatments now being opposed, and he does not know that it has ever been shown that any one has died from any of these. Adulteration and short weight should, of course, be prevented, but the matter should be handled by the police and not by a health department, and the cost should not form a part of the health budget.

Among the incorrect popular ideas which are officially recognized in many health ordinances are those that defective plumbing is injurious to health, that houses and furnishings should be disinfected or fumigated at the termination of certain diseases, and that dirt of any kind is unsanitary.

Finally, Dr. Armstrong gives a list of health measures of prime importance and those of secondary importance for New York State. There will, he says, be inevitable overlapping, and what is of secondary importance in one part of the country might be of prime importance in another; an illustration of this being the extermination of rats, which is most desirable on the Pacific Coast to avoid plague, but for which there is no necessity in the North Atlantic ports. These lists are as follows:

- A. Health measures of prime importance:
 1. The suppression of communicable and industrial disease.
 2. The reduction of the infant mortality.
 3. The control of the milk and water supply.
 4. The medical inspection of school children.
 5. The study of contact and secondary infections, and the control of disease carriers.
 6. The control of hereditary and congenital disease factors.
 7. Birth, death, and marriage statistics, and bookkeeping to determine the value as a life-conserving force of any expenditure made.
 8. Publicity and educational work.
 9. Sanitary research.
- B. Health measures of secondary or of indirect importance.
 1. The control of housing conditions and other general environmental factors.
 2. Inspection of foods and drugs.
 3. The handling of municipal wastes.
 4. The suppression of nuisances.
 5. Insect and rodent elimination.*
 6. Plumbing inspection, smoke inspection, etc.

HOUSE SEWER IN STORM SEWER.

In constructing a house sewer in Somerville, Mass., last year advantage was taken of the fact that the sewer could be laid at about the grade of the invert of an existing storm sewer; and 1,430 feet of 12-inch vitrified clay pipe with Portland cement joints was laid in the invert of an existing three and one-half foot storm drain structure (built in 1898), the storm water to a certain depth flowing in newly made channels constructed with Portland cement on either side of the 12-inch pipe sewer, which in times of heavy storms is completely submerged. A number of thousand dollars was saved by this method of construction; for an open cut of about 13 feet in depth would otherwise have had to be made in a narrow, asphalt-surfaced street, where double car tracks exist and many underground pipes and conduits would have been encountered, as well as a large amount of rock excavation; also great inconvenience to travel and business would have been occasioned.

*This would be of prime importance in certain communities where malaria, yellow fever (mosquitoes) and plague (rats) exist. It is probable also that house flies are of considerable importance in the transmission of diarrheal diseases of infants.

LIBERTY SEWAGE DISPOSAL PLANT

Septic Tank and Contact Bed Plant for a Small Town— Modifications and Extensions During Fourteen Years of Operation.

The sewage disposal plant of Liberty, N. Y., a town of something over 2,000 population, is of the septic tank type, with contact beds and fine grain filters. It was installed in 1899 and 1900, enlarged in 1901-1902 and again enlarged and changed in 1908 and 1909. As originally installed, the system was as above with the exception that coarse grain filter beds were used, instead of contact beds. These beds, four in number, were designed to act in independent batteries of two beds each, alternating by means of a mechanical apparatus intended to change the flow automatically in each battery, from one bed to the other. Thus one bed would be filled to a certain level, then immediately begin to drain out while the second bed was filling. This would then begin to drain out and the operation would continue until the two beds were thrown out of use and the other two beds were brought into use. This method of operation was similar to the operation of contact beds, with the important exception that when a bed was filled, no time was allowed for the sewage to remain in contact with the filtering material. The filtering material in the original beds was cinders.

However, shortly after the work had been completed in 1900, it was found that the septic tanks filled too rapidly and that the sewage did not receive the proper treatment. Consequently the system was enlarged. It still gave some trouble though, and in 1908, Waring, Chapman and Farquhar, civil engineers of New York City, were retained to locate the trouble and correct it. Mr. Farquhar went over the ground very carefully and decided that the fault lay in the sewer line and in the coarse grain filter beds. The plant, he found, was large enough to care for the Liberty sewage for some time to come.

In his investigations of the sewer main he found that not only were roof leaders connected with the sewer but that many drains, etc., discharged into it.

In wet weather the flow of sewage increased to two or three times its dry weather flow. A large amount of soil and gravel was washed into the septic tank, completely filling the grit chambers. An investigation of the main was ordered and it was found that for more than half a mile, where the sewer was laid below the ground water level, in a large percentage of the cases—far more than half—the bottoms of the joints were not cemented. The main was therefore repaired and all mains and roof leaders cut off. The result was apparent at once in the lesser flow of waste water and in improved conditions at the grit chamber. A search was also made all over the village for broken and leaky sections.

There were found to be two imperfections in the building of the septic tanks, although the tanks were in general well arranged and constructed. The surface of the weir, or channel over which the liquid passed out of the septic tanks, was found to be $\frac{1}{2}$ -inch too low at one end. The result was that when both tanks were in use, which was always the case except when one was being cleaned, the tank which had the low point in the overflow received much more than its share of sewage. This was confirmed by the difference in the scum on the top of the contents of the two tanks.

The other imperfection that caused some trouble was the lack of sufficient depth in the baffle boards which extend across the septic tanks near the overflow channel.

These boards were intended to hold back the heavy scum and prevent it from passing out through the overflow channel. They were lowered 18 inches, making them at present about three feet below the roof of the tanks. All the liquid passing out of the tanks passes out under these boards.

The changes in the septic tanks, as noted above, and the repair made to the sewer did away with much of the trouble. However, the direct passage of sewage through the filtering material without filling the beds at all is of very little value in treatment of sewage. It is impossible to distribute the sewage uniformly over the surface of filtering material so coarse that the sewage meets no resistance in passing through at the place where it is applied. The four coarse-grain filter beds were therefore practically useless even as strainers. Under the advice of Mr. Farquhar it was decided to change these. The mechanical apparatus, or "tipple" system, did not work successfully and was abandoned.

The four coarse-grain filters were therefore changed to contact beds. Cinders were not considered satisfactory material for the beds and were replaced by broken stone. Local stone was used in sizes from $1\frac{1}{2}$ inches to 3 inches. Two thousand yards were required for the four beds. The cinders were removed at a cost of 50 cents a yard and the stone cost \$1 a yard, broken and put in place.

Making a conservative allowance for the decrease of capacity, voids may be estimated at 25%. The holding capacity of each bed is then 22,500 gallons approximately. Under the assumption that one-half the daily flow of sewage reaches the plant in eight hours, a contact period of one hour is allowed for each bed. Operation is then at the rate of about 360,000 gallons per day and each bed has two hours to drain out and rest before it receives another filling. The cycle of operations is as follows:

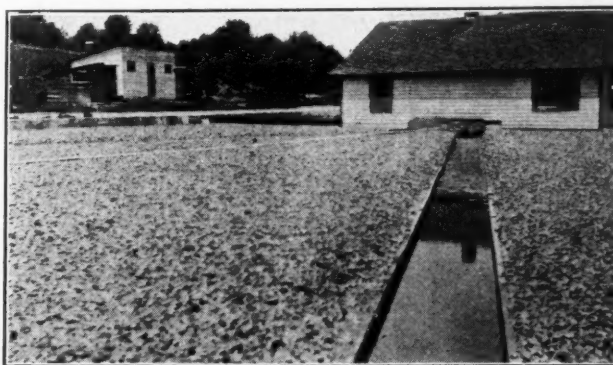
One hour filling.

One hour standing full.

Two hours draining out and resting.

This cycle is accomplished by an automatic apparatus in which the sewage stops and starts by the action of siphons and sluiceways which operate by the compression and release of air. The cost of the apparatus was about \$1,200 and the masonry changes made necessary by the installation cost slightly less than \$500.

The beds at times have been required to operate at



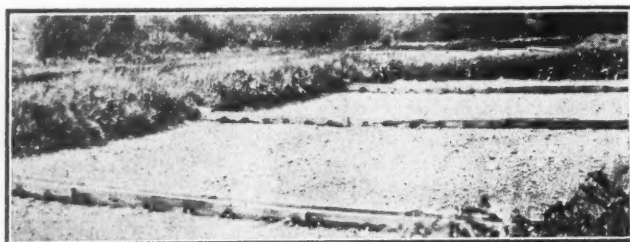
CONTACT BED—DRAINING.

higher rates than the design calls for, but even under the overloaded conditions were much more efficient than under the previous methods of operation.

The original fine grain filter beds covered an area of about one-third of an acre, or more exactly 14,700 square feet. Since the above changes were made, this area has been sufficient. However, there has been trouble in distributing the sewage evenly over the beds. When first

designed, the sewage was discharged on each bed from three or four outlet pipes along each side. The sewage descended so rapidly into the filtering material at these points that they became more or less clogged, while other parts of the filter are out of use. An essential feature of sewage filtration is uniform distribution. This was accomplished by laying distributing troughs across the filters from each outlet pipe. There are openings in the sides of the troughs. Tarred wooden troughs, anchored down by iron straps buried in the beds, are used. The change of flow from one fine grain filter to another is done by hand.

Although there has been an average of 1,000 feet of sewer laid per year since the above repairs were made, the system is working perfectly and has given little trouble since the changes were made. Of late, though, there has been a deposition of the sand in the septic tanks and plans are now being prepared for the construction of a grit basin at a point just above the septic tank. The estimated cost of the grit chamber is \$1,200.



FINE GRAIN BED, DRAINING.

No figures are at hand in regard to the cost of the original plant, but there are approximate figures of the cost of the repairs made in 1908.

Repairing main sewer.....	\$2,500
Repair of lateral sewers, manholes, etc.....	500
Alterations at septic tanks.....	50
Cleaning tanks and care of sewage.....	150
Removing cinders from coarse grain filters...	1,000
Filling with broken stone.....	2,000
Automatic control	1,200
Masonry changes	500
Troughs and equipment.....	200
Total.....	\$8,100

COMPULSORY SEWAGE PURIFICATION IN NEW JERSEY.

In October, 1906, the State Sewerage Commission of New Jersey directed the town of Phillipsburg to cease polluting the Delaware River with sewage, allowing it twelve months to install the plant necessary for this. As the town took no action on this notice, the State Board of Health (to which in 1908 was transferred the jurisdiction over these matters) appealed to the Court of Chancery for a mandatory injunction compelling it to treat its sewage. Decision in this suit has just been rendered by the court, which issues such injunction, requiring the town to make such disposal of the sewage "as shall be approved by the State Board of Health." It is expected that this decision will be appealed from by the town. The Chancery case occupied six years; it is to be hoped that the decision on the appeal will be given in much less time. The State Board expresses its desire to do all it can to expedite it.

The arguments of the town were: (1) That the transfer of the jurisdiction from the State Sewerage Commission to the State Board of Health by a supplement to the original act was nugatory because the title of the original act referred to the commission as receiving this jurisdiction, and this title was not changed. (2) That the

Delaware River is not one of "the waters of this state," to which the jurisdiction of the State Board was confined. (3) That actual injury to any citizen of the state by the pollution has not been demonstrated.

The court held that neither of these arguments was valid; and concerning the last said: "The injury need not be actual, but only threatened"; and the river at Trenton is so polluted by sewage from Phillipsburg and other cities that injury to the inhabitants of Trenton, if not actually caused, is at least threatened.

OPERATION OF SEWAGE DISPOSAL PLANTS

Chemical Precipitation—Sludge Large in Quantity and of No Commercial Value—Process Useful for Certain Trade Wastes.

By FRANCIS E. DANIELS, A. M.*

This is the ninth installment of a series of articles by Mr. Daniels. The others were as follows: January 15—Grit chambers and screens; regular frequent cleaning most important. February 19—Skimming, sedimentation and septic tanks; keeping daily records of operation; duplicate units; treatment of sludge and scum. March 10—Emscher tanks, principles of operation and design; baffles and scum boards; gas vents and scum; cleaning slopes and slots; drawing off sludge; sludge beds and sludge disposal. April 16—Contact and sprinkling filters—periods for each of the four phases; filtering medium and drainage; keeping surface open; automatic control apparatus; how to make putrescibility tests. May 21—Sprinkling filters, care of nozzles, settling basins; natural and artificial sand filters. June 18—Operation of sand filters; land treatment; sub-surface irrigation. July 16—Disinfection; purpose, principle, history. Condition of sewage necessary. Application of hypochlorite. August 20—Purchasing hypochlorite; apparatus for applying it. Liquid chlorine.

CHEMICAL PRECIPITATION.

The principle of chemical precipitation is the bringing together in solution of two or more soluble substances which combine with each other to form an insoluble compound that settles out. During this process suspended matters are caught and carried down with the precipitate. The process is, therefore, preliminary only and has its limitations. It does not remove many of the substances that are in solution, and in consequence of which the effluent is left in a state capable of putrefaction which may result in objectionable deposits and local nuisance. Such a treatment, then, comes within the same category as fine screens, septic, sedimentation, or Imhoff tanks. In some cases, however, when larger quantities of chemicals are used, sufficient disinfection may occur to delay putrefaction until some large body of water is reached so that the risk of local nuisance is lessened. This is usually more apparent in the treatment of certain trade wastes.

Proposals to use such a process on sewage date back over a hundred years. As early as 1762 a patent was taken out "for the purification of dirty water by a chemical process." It was not, however, until the necessity for the treatment of town sewages and trade wastes in England arose that chemical precipitations became of much practical value. Even then an impetus was given by the attempts toward utilizing the manurial value of domestic sewage. Hundreds of chemical precipitation processes were patented and the number of chemical agents proposed was enormous. The hopes of financial gain, however, were not realized. "Of 234 towns which had adopted the chemical process, 204 had incurred expenditures without realizing any income whatever; the remaining 30 had indeed obtained an income, but this was often only a few shillings which had been received for a few cart loads of sludge. In no case had a profit been realized."

However, the splendid results obtained in laboratory

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experiments and specially constructed experimental works led the authorities of English towns to persevere with experiments. Salford has at different times tried 13 different methods, Birmingham 7, and almost every large English town can boast of a similar experience.

A few German towns tried chemical precipitation with the same results as those obtained in England. There was effected a satisfactory removal of the suspended matters, but the effluent was putrescible and deposited solid matters in the bed of the stream. The process was very expensive and produced much larger quantities of sludge than did simple sedimentation. The sludge was unsaleable and owing to its putrescent character created local nuisance. Sludge presses were installed in the early '80's and are still in use. The presses convert the sludge into solid cakes, which are at least transportable.

Notwithstanding the failure of the biological methods to do everything claimed for them, chemical precipitation has been gradually given up until now it is only found in exceptional cases. In Europe it is still used as a preliminary to biological purification, while in this country it is occasionally used in the treatment of a trade waste or of a town sewage containing a large percentage of some particular factory pollution.

The first chemical precipitation plant for sewage in America was established at East Orange, New Jersey. The operation was considered too expensive, however, and some years ago the plant was abandoned, so that at the present time the only sewage plants using chemical precipitation in this state are a few small installations taking care of special trade wastes. In fact, about the only plants of this description in the United States mentioned in the treatises on sewage disposal are those of Worcester, Massachusetts, and Providence, Rhode Island. The Worcester plant was put in operation in 1890 and the Providence plant in 1901.

As it is not the present purpose to discuss in detail the process of chemical precipitation, the reader is referred to the many books on sewage disposal, each of which takes up this subject more or less at length. In 1890 the Massachusetts State Board of Health published an extensive report on the chemical precipitation of sewage based upon a very large and comprehensive series of experiments and investigations. To this work the reader is also referred.

As stated above, almost innumerable substances and combinations have been tried for the chemical precipitation processes, some of which work better than others under different conditions; and because of the difference in the various local conditions and compositions of different sewages, no one substance can be selected as best for all cases. In the Alumino-Ferric process a mixture of ferric and ferrous salts with aluminum sulphate, alone or with lime, is used. The International process consists in adding a compound called "ferrozone" to the sewage, and filtering the effluent through "polarite." These two substances are obtained by patented processes from iron deposits in South Wales. The A. B. C. process originally included (among a number of substances) alum, blood and clay, but later alum, clay and carbon were used.

Taking everything into consideration it seems that the chemicals best adapted to the treatment of sewage are ferric sulphate and lime. Aluminum sulphate is better than ferrous sulphate; but as ferrous sulphate is more easily and cheaply obtained it is generally used instead of either ferric or aluminum sulphate. In many cases copperas (ferrous sulphate) and lime together give nearly as good results as ferric sulphate, while lime or alum used alone are not quite so satisfactory.

When ferric sulphate or aluminum sulphate is used the addition of lime is unnecessary and the application of

the chemicals is by means of proper regulation of concentrated solutions. Within certain limits, the greater amount of the chemicals used the better clarification will result, the alkalinity in the sewage being sufficient to cause the precipitation.

With lime, however, considerable care must be used to apply just the right amount to secure the best results. When too little is used the process is inefficient and when an excess is added it is wasted. With a large excess of lime the clarification is accomplished by the settling of the undissolved calcium hydrate. When smaller quantities are used the carbonic acid of the sewage combines with the lime to form calcium carbonate, which in settling causes the clarification. As calcium carbonate is somewhat soluble in sewage containing carbonic acid, enough lime must be added to combine with all of the carbonic acid to get the full effect of the calcium carbonate. Except, perhaps, in the cases of certain acid sewages "the lime process has little to recommend it." A large amount of lime water is needed, a very accurate adjustment of lime to the sewage is necessary, and a very close supervision of the operation is required to obtain good results. If, however, the sewage contains a goodly proportion of iron pickling liquors, as at Worcester, the addition of lime alone produces good results. The lime is ground up with water and fed to the sewage in a milky consistency. In general better results are obtained with fresh sewage than with stale.

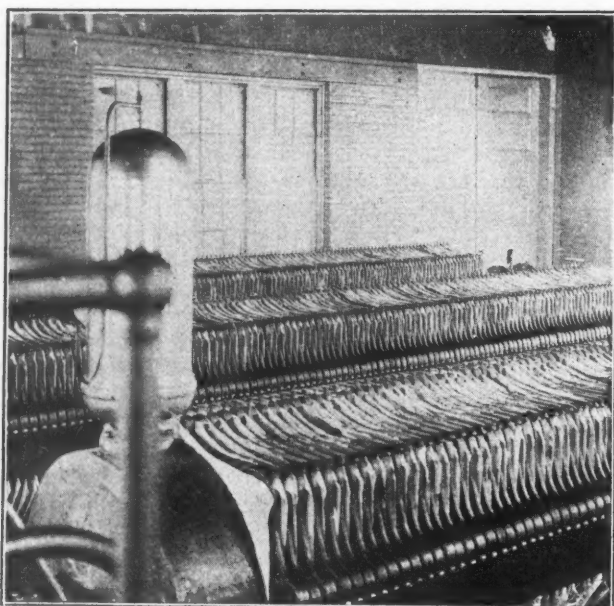
The precipitation with copperas also requires skill and close supervision. The chemical is not precipitated by the alkalinity of ordinary sewage and a small amount of lime must be mixed with the sewage before the copperas is applied. "The quantity of lime required depends upon the composition of the sewage and the amount of copperas used, and can be calculated from a titration of the sewage. When copperas is added to the sewage alone, no precipitation takes place, and the result is no better than when sewage settles alone. The addition of enough lime to combine with the excess of carbonic acid over the amount required to form bicarbonate, and to combine with the sulphuric acid of the copperas, is necessary for precipitation; for, while sewage is alkaline, its alkali is all in the form of bicarbonate, and alkali as normal carbonate or hydrate is required to precipitate the iron. When this amount is added, the acid number with phenolphthalein will be zero. To insure a rapid action, a little more than this should be added. No better result is obtained when more lime is used. If much less is used, the iron will not be precipitated. If enough or too much lime has been used the mixture will color phenolphthalein red, while if too little has been used no color will be produced. This test affords an easy and accurate method of applying enough lime and of avoiding an excess. Very imperfect results are obtained with too little lime, and an excess is wasted when too much is used. With a suitable amount of lime the more copperas used the better the results; but with more than one-half a ton per million gallons the improvement does not compare with the increased cost. The amount of iron left in the effluent is much greater than with ferric sulphate, owing to the greater solubility of ferrous hydroxide."

The sludge resulting from the precipitation with lime and copperas is more easily handled in sludge presses than that from alum, although an excess of lime with considerable water causes some of the sludge to become emulsified, which makes the pressing of it well nigh impossible. The addition of lime to the drained sludge, however, makes it more easily pressed.

The efficient and economical management of a chemical precipitation works requires in constant attendance a trained man who must detect the changes in the sew-

age and accurately adjust the application of the chemicals to meet each change as soon as it occurs. The frequency of such occurrences will depend upon local conditions; and as these vary so widely the attendant must make a careful study of his plant, the processes involved, and the results to be accomplished. In general, the attendant should know just how much chemical is required and the exact strength of his solutions. Excesses of precipitants should be avoided, both on account of the waste of the material and for fear of injuring fish life in the stream. Most fish are extremely sensitive to chemicals and an overdose is likely to cause the death of the fish in the adjacent parts of the stream.

After the sludge has settled, the clear liquids are drawn off and the sludge removed and disposed of as any ordinary sludge. Frequently it is forced into specially constructed sludge presses and pressed between layers of canvas or sack cloth. The pressed cake is more easily handled. In some instances it is used for land filling and in others it is dumped into deep water.



SLUDGE PRESSES AT WORCESTER, MASS.

In order to make the status of chemical precipitation more plain it may be well to quote the following resume from George W. Fuller's excellent book on "Sewage Disposal":

"Chemical precipitation affords efficient clarification, but the removal of finely suspended matter, due to coagulation, does not permit a stable effluent to be obtained from ordinary city sewage. The effluent is freer from organic matter than that obtained by plain sedimentation, and this allows a smaller degree of dilution when dispersed in water, and of a higher rate of filtration, other things being equal. But present evidence shows strongly that the improvement in the quality of the effluent over that obtained by plain sedimentation is not commensurate with the cost involved."

For ordinary sewages the day of chemical precipitation plants is rapidly passing. In the case of certain trade wastes there may be a field of usefulness for this method of clarification. With good management this method of treatment has not given much trouble as to odors, but it has developed complications as to the clogging of fine grained filters, as will be mentioned in connection with intermittent sand filters.

Comparing it with plain sedimentation in two-story tanks, chemical precipitation does not now give promise of being a serious competitor in the treatment of fairly normal sewages.

ELECTROLYTIC TREATMENT.

In some respects electrolytic treatment of sewage is closely allied to chemical precipitation, while in others it resembles disinfection.

Briefly, the process consists in passing the sewage between a system of electrodes, arranged in a channel conducting the flow. When the electrodes are active, such as iron or aluminum, they are gradually dissolved and quite a precipitate is formed therefrom. This aids in clarification. With passive electrodes, such as carbon, disinfecting substances, such as hypochlorites, are formed from the salts found in the sewage.

The underlying principles of the process are the fundamental laws of electrolysis and electro-chemistry, and the plants must be constructed and operated in accordance with those laws.

Twenty-five years ago the Webster process of treating sewages by electrolysis attracted some attention in England. More recently the Santa Monica and Oklahoma City plants have been more or less exploited and since then the new process of W. B. Bull has been made the subject of experimentation.

In New Jersey several attempts have been made to induce sewage companies and municipalities to install plants for the treatment of sewage by electricity, but up to the present time little has been accomplished. Both the process of precipitation by the use of active electrodes (iron or aluminum) and the application of ozone has been proposed. A plant using aluminum electrodes has been installed in Maryland for the treatment of creamery wastes, and the writer has been informed recently that the results are very satisfactory and at a very small cost. The ozone installations have not been so successful although at present extensive experiments with ozone are still being carried on in New Jersey.

In regard to the practical management of electrolytic plants for sewage treatment little can be said other than to urge the man in charge to familiarize himself thoroughly with all the fundamental principles regarding the process of treatment. Unless every stage is operated with care and intelligence, unsatisfactory results will be obtained and the cost will be excessive. The writer has upon several occasions come in contact with men who were straightforward and conscientious, but who were almost entirely prevented from making their experiments succeed because of ignorance of the fundamentals.

In regard to electrolytic treatment also the writer would quote from Fuller's "Sewage Disposal":

"Electrolytic treatment does not seem to afford a practical means of direct oxidation of organic matter in sewage so that the latter will be stable or non-putrescible. In fact, a substantial removal of organic matter is not a function of this process as applied up to this time.

"To some extent, however, oxygen is given off and this may aid in deodorizing sewage and reducing the quantity of unstable organic matter.

"As an aid to sedimentation, electrolytic treatment with iron electrodes is capable of practical use. There is no economy in this over the use of salts of iron now on the market. Aluminum electrodes are prohibitively expensive.

"The Bull process of using electricity to separate the acid ions of salt solution for use in making perchloride of iron, with a recovery of caustic soda as a by-product, seems to offer some hope of practical merit. It is beyond the experimental stage.

"With any form of electrolytic treatment, sedimentation with or without filtration should be employed.

"Direct oxidation of the fairly unstable organic matters of sewage may be secured with the aid of electrolytic treatment through the preparation of hypochlorites, as described later. This is essentially a sterilizing procedure and not aimed at the production of a stable effluent.

"Electricity may also be used in sewage treatment through the preparation of ozone. This has received considerable discussion at intervals, but it is not on a working practical basis at the present time."

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SEPTEMBER 17, 1914.

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Descriptions of Operating Plants.

From time to time there are given, in this and other publications, descriptions of sewage treatment, water purification, garbage disposal and other plants which are still under construction or but recently completed, in order to keep engineers and others informed as to the latest practice in these several lines. Generally, however, there is only the reputation of the designers or the judgment of the reader on which to base an opinion as to how effective a new feature in design will prove in operation (neither of which can be relied upon absolutely), and little is heard of the later history of the plant, for reasons which we have previously discussed. The result is that the effectiveness of any given design under known conditions is seldom learned, although, in the absence of any reliable data on the subject, it may be copied time and again by other less experienced, confident or ingenious designers.

This absence of operating data is our excuse for describing this week a sewage disposal plant which is fourteen years old, and narrating (with too little completeness, we confess) the difficulties experienced in operating it and the changes made. We hope to present from time to time statements of experiences with other plants which have been in operation a sufficiently long time to bring to light minor defects in design, construction or operation, and we urge that those who have available experiences of this kind will permit us to publish the same as their contributions to the general

fund of information which all of us draw upon and all are consequently under obligations to add to. When requested, we will keep the name of the town absolutely secret, but sufficient data should be given to bring out the full and true significance of the phenomena described.

Fitchburg's Sewage Treatment Plant.

The plans of the Fitchburg sewage treatment plant given in this issue contain some novel features in the designing and construction of Imhoff tanks and sprinkling filters, the working out of which should be watched carefully to determine their effectiveness. One of these is placing the beds for drying the Imhoff sludge higher than the sewage level in the tanks and raising the sludge onto them by the air lift. It seems possible that even this method, as a substitute for pumping, may break up the sludge and release the gases which are so important in the drying of Imhoff sludge; and the effectiveness of air in lifting this sludge may be questioned by some. Features of the construction which will attract notice are the methods of supporting the sloping bottoms of the sedimentation channels by steel channels and the construction of the bottoms themselves of ribbed metal lath plastered by use of the cement gun. It will be noted that less than one-sixth of the area of the tank is left open for a gas vent and scum-collecting surface; also that the vents to the two inverted troughs over the sludge chamber occupy less than one-third of the length of the chamber, the remainder therefore being inaccessible for breaking up scum. (See Municipal Journal, March 19, 1914, page 390.)

Perhaps the most noticeable features of the sprinkling filters are the depth of stone (ten feet; 5 to 8 feet has been the more common practice); screwing the sprinkler nozzles directly into the distribution pipes and resting these on the filtering medium without any piers or other solid support; the lining of the excavation with rib metal plastered by use of the cement gun; the floor construction, and the flushing gallery. The importance placed upon the depth of stone may be judged from the fact that the cost of this stone is nearly one-third that of the entire plant, and that if it had been made but five feet, about \$40,000 could have been saved.

Perhaps the most interesting features of the secondary tanks are the use of the downward flow principle, and the idea of mixing the accumulating sludge with the Imhoff sludge to prevent nuisance.

The total cost of the plant—about \$210,000—gives the average per capita cost \$5.18 on the basis of present population; or about \$4.25 on the basis of capacity.

Human Life and the Law's Delays.

If the basis of court decisions were common sense and equity instead of red tape and precedent, the new Jersey town referred to elsewhere in this issue would not have been permitted to continue for six years to defy the board of health, and the legislature which defined its powers, on the basis of a legal quibble about the title of a bill, the intent of which was not disputed.

There may have been defensible arguments against the enforcement of the order of the health board—as for instance that the mitigation of the nuisance and injury lay in some other action or with other parties; but opposition based on the wording of a title should have been thrown out of court in six minutes instead of six years. Probably most other courts would have acted similarly, but that only serves to show that the letter of the law is to them more important than the spirit or than reason, justice, humanity or any other consideration whatsoever.

The WEEK'S NEWS

New Jersey Road Repairs—Street Work in Chicago, Ill., Springfield, Mass., Norwich, N. Y., and Kalamazoo, Mich.—
Commissioner Carlisle on Vehicle Taxes—Baltimore Water Shortage—New Water Supply Constructions in
Atlantic City, N. J., Fort Worth, Tex., and Boston, Mass.—New Motor Fire Apparatus—New York's
Finances—Commission Government Progress.

ROADS AND PAVEMENTS

New Jersey Wants Uniformity in Road Repairs.

Trenton, N. J.—In order that there may be more uniformity in the road work in the different counties of the state, Commissioner Edwin A. Stevens, head of the state road department, is formulating a set of instructions for each county supervisor of roads. The instructions will specify certain methods which the state department desires the county departments to adopt in their road building. Commissioner Stevens expects, under these instructions, to see eliminated much of the confusion which has resulted from a conflict of opinion as to how department work was to be carried out. Commissioner Stevens expects to have the new regulations in shape in time to become effective November 1 next. The state road commissioner is also planning a codification of the laws on the statute books regarding supervision and care of the state's roads. He has gone back three or four years in a study of the provisions and enactments on this subject and finds many inconsistencies which he hopes to eradicate by getting the legislature of next winter to pass a new law governing this work.

Begin Concrete Road Work in Chicago.

Chicago, Ill.—Cook County work under the new state aid road law has been started recently when large numbers of concrete pouring machines took up the task of transforming mud roads eighteen inches thick into boulevards eighteen feet wide. On five of the county's principal highways the start was made, and according to the contracts, Nov. 1 will see thirteen and a half miles of the re-enforced concrete driveways in use out of all sides of Chicago. That will represent the first year's operation of the new law, under which it is planned to ultimately improve 325 of the 1,325 miles of highway outside city and village corporate limits in the county. This year's work will cost \$240,000. "These roads are being constructed according to specifications drawn up by the state commission," said Mr. Quinlan, county board superintendent. "In all cases a re-enforced concrete road eighteen feet in width will be required. That pavement will be eight inches thick at the crown and six inches thick at the edges. Expansion joints will be placed every 100 feet. These joints consists of quarter-inch layers of bituminous felt that will insure the concrete roads against cracking under all sorts and conditions of weather. And beneath the edge of each pavement a longitudinal drain eight inches wide and six deep will be constructed for the entire length. From the longitudinals lateral drains will be placed every fifty feet, making as nearly as possible the perfect road. This rebuilding of the roads will necessarily mean the construction of many new bridges and culverts and the rebuilding of many old ones. Plans and specifications for that work have already been drawn up, and the construction will run apace with the roads. According to our present good roads plan, there are 325 miles of highways that have been desig-

nated as state aid roads. These will eventually be converted into boulevards under the plan by which the state and county jointly bear the expense. That leaves 1,000 miles of roads which must be kept in repair by the county and townships."

City Will Test Own Cement.

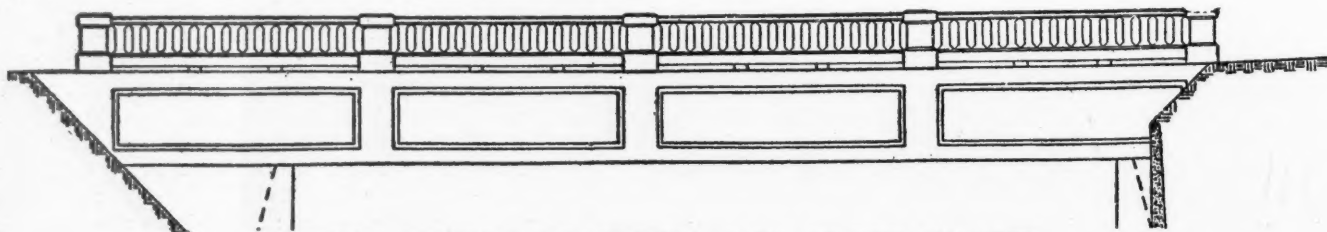
Schenectady, N. Y.—Hereafter all cement used on city contracts is to be tested in the office of the city engineer instead of having it done by private corporations in this city or in Albany. This is an innovation, most of this work having previously been done in Albany and none by the city itself. A new Fairbanks testing scale and other necessary apparatus have recently arrived and have been installed in the city engineer's office. A class has been conducted to familiarize the assistant engineers with the process so that each will be able to make the tests, which will be in charge of City Engineer William B. Landreth and Deputy City Engineer W. Earl Weller.

Lay Over Six Miles of Permanent Pavement.

Springfield, Mass.—The task of spending \$381,000 to lay about 12 miles of new paving and to repair some of the old is not proving an onerous one to the street department. Already the year's paving program is more than half done and the gangs are well ahead of their schedule. In 1913 the city got 10½ miles of new paving, of which four miles were of the permanent type. This year a couple of extra miles were added to the annual building schedule. The paving of Belmont avenue with asphalt on concrete, one of the most important jobs, is finished. Only one more job of wood-block surfacing remains to be done, and that is Stockbridge street. Orange street, which is to be widened to 60 feet and paved with tar macadam, is the biggest job now listed among those as yet untouched. When the regularly planned work is finished, if there is a balance, it probably will be turned into surfaces for other streets, but at present the indications are the appropriation will be exhausted.

City Engineer Designs Concrete Bridge.

Atchison, Kans.—The accompanying illustration is an elevation of the new reinforced steel and concrete bridge to be built at Fourth and Main streets. It will consist of fourteen reinforced concrete girders 52 feet long, 24x42, set on bench walls which have a pile footing, and will be capable of sustaining a twenty-ton trolley car. There will be 470 cubic yards of concrete, and 67,000 pounds of steel used in its construction. Instead of heavy concrete bench walls, a concrete hand rail will be put on each end girder. The bridge will be covered with a brick block paving on a concrete base, with an asphalt filler, and will have a twelve-foot concrete walk on each side. The bridge was designed by Frank S. Altman, city engineer, and will cost approximately \$10,000. It will be the largest reinforced girder bridge in this vicinity. F. J. Buis, of St. Joseph, Mo., has been awarded the contract.



BRIDGE DESIGNED FOR ATCHISON, KANS., BY CITY ENGINEER.

Carlisle Would Tax All Vehicles.

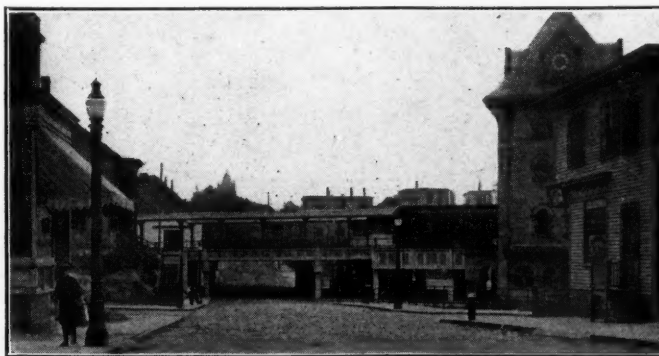
Albany, N. Y.—Commissioner Carlisle is in favor of having legislation enacted that will make it obligatory on all vehicles using the highways to pay their share towards the upkeep of the roadbeds, by charging them a state license, the same as is now charged automobiles. At a recent gathering of good roads men he said: "Last year we had 1,000 more miles of roads in this state and a million and a half less to maintain them. The license law is inequitable. Suppose we build a good road and some fellow secures permission from the public service commission to operate a bus line. His automobiles are going over the road all the time, fair weather and foul, and will tear it up quicker than 1,000 farmers or autoists. Yet he pays five dollars a year for each of his commercial vehicles. If he were running a trolley line he would have to pay a special franchise tax which would amount in some cases to about \$100,000 a year. Yet he is using our roads as a trolley line. The man who owns a Ford, say, pays about enough as it is. When you get above that, you ought to pay pro rata. We have got to have a general vehicle tax. Near Poughkeepsie we built a good road which cost \$12,000 a mile, and as soon as it was open 20 teams commenced to draw stone over it from a nearby quarry which could never have been opened were it not for the road. These 20 teams tore the road to pieces in a short time. Yet the owners of the quarry paid nothing for the maintenance for the road they were destroying. They ought to be made to pay. I believe in a fair tax imposed as it ought to be imposed—not an excessive one."

Complete Road Year Before Contract Time.

Norwich, N. Y.—The state road between Norwich and Oxford, which is being constructed by the Newport Construction Company, is progressing along very rapidly. The total length of the road is over 10 miles and it is estimated that it will be finished by October 1, one year ahead of contract time. This is a remarkable performance considering the condition of the weather most of the summer and the extent of the work. In connection with the contract the company has over 4,000 feet of brick pavement in the city and the resurfacing of the Oxford-McDonough road. The Newport people have been rushing the work from the very start, employing nearly 300 men and 75 teams. The laying of the brick in the South Broad street pavement was begun ahead of time. The type of construction is regular, with a water-bound macadam top surface.

Lynn Grade Crossing Elimination.

Lynn, Mass.—After a controversy that lasted five years between the Boston and Maine Railroad and the city the grade crossing at Silsbee street has been eliminated. The street has been closed for four years and only the persistent efforts of City Solicitor Arthur G. Wadleigh, the city council, and the Lynn Board of Trade could force the final result. The original decree and plan of the special commission for the elimination of grade crossings was filed in 1907 and confirmed by the Superior Court soon after. After various plans were proposed and refused, the street was finally depressed. The street is repaved with cement grouted granite block and broad granolithic sidewalks. The illustrations show two views of the street.

**New Mixer for Kalamazoo.**

Kalamazoo, Mich.—Kalamazoo's new \$1,600 concrete mixer has arrived from Milwaukee and been put to work on the new Vine street bridge. City Engineer Lenderink expects to lay the entire concrete top for the bridge in one day with the new mixer. It has a capacity output of 1,000 square yards of concrete for 10 hours. The south walls for the new bridge are complete, and the eye-beams have been set into position. The total weight of the mixer is 11,800 pounds. There is a 20-foot delivery boom, which makes it possible to reach a wide radius while spreading the tops for new pavements. The plant is capable of propelling itself at the rate of three miles an hour. It is rigged with a 10-horsepower Wachs engine and a 10-horsepower boiler. The new mixer was purchased by the council after a special purchasing committee had been appointed to accompany City Engineer Lenderink to Chicago for the purpose of examining different style plants in operation. The city has decided to do part of its paving and to do the concrete foundation for all paving. The new mixer will be used on this work and on several small concrete bridges to be constructed. The one they purchased was made by the Chain Belt Company, of Milwaukee, Wis.

SEWERAGE AND SANITATION**Drinking Water Polluted.**

Sault Ste. Marie, Mich.—Confirmation of the recent report of a government surgeon to the effect that the water which is being used in this city is unfit for consumption has been made by the international joint commission in a report of its investigation of the boundary waters to the governments of the United States and Canada. In part the report states: "The third cross-section, just above the water works intake of Sault Ste. Marie, Mich., showed practically the same degree of pollution as the previous one which is in the vicinity of Whitefish Bay. Water from this vicinity ought not to be furnished by the municipality without adequate treatment of some kind. The pollution of the water shown here probably explains the continued excessive typhoid rate of this city, especially during the navigation season. The samples from above the Canadian ship canal showed great increase of pollution, much of which is probably due to concentration of shipping at this point. The use of water from such a source is extremely dangerous. Unfortunately, the water supply of Sault Ste. Marie, Ont., is taken from the river just below these points. Acute outbreak of typhoid must always be expected from the use of such seriously polluted water. For a number of years past the Canadian Soo has been troubled with outbreaks of typhoid while the Michigan Soo has had but few cases and some of these could be traced to outside sources."

Sewer System Completed.

Beaver Falls, Pa.—The \$150,000 sanitary sewer system has been completed, the Pietro Paving & Constructing Company, which had the contract, having laid the last section of pipe. 19¼ miles have been laid in the two years of the work, the size of the sewer varying from 36 inches to 4 inches. If the State Department of Health accepts the plans the disposal plant construction will be started immediately.



Courtesy, Lynn (Mass.) Daily Evening Item.

STREET DEPRESSED FOR GRADE CROSSING ELIMINATION.

Will Fight Order to Stop Polluting.

Phillipsburg, N. J.—The town of Phillipsburg has decided to fight the recent ruling of Chancellor Walker, ordering a mandatory injunction to prevent Phillipsburg from sewerage into the Delaware River and also to prevent it from maintaining a loathsome "dump" of putrid vegetable and animal matter that is being daily washed into the stream from which Trenton and other cities take their supply of drinking water. The Town Commissioners of Phillipsburg have instructed Town Solicitor John I. B. Reilly to continue the services of ex-Supreme Court Justice Gilbert Collins, of Jersey City, to carry the case to the Court of Errors and Appeals. In the suit in which Chancellor Walker rendered his decision last Friday, Phillipsburg contended that the transfer of powers from the State Sewerage Commission to the State Board of Health, which body brought the suit against the town, was faulty and that, therefore, the State Board of Health was without authority to interfere with Phillipsburg's method of sewerage into the Delaware River. The Chancellor, in his opinion directing the mandatory injunction against Phillipsburg, however, upheld the act transferring this power from the State Sewerage Commission to the State Board of Health.

Mayor Proclaims "Disease Prevention Day."

Richmond, Ind.—Mayor Robbins has issued a proclamation asking citizens to co-operate in the observance of "Disease Prevention Day," and designating the day as Friday, October 2, as proclaimed in Governor Ralston's recent proclamation. The mayor's proclamation follows:

"To the People of the City of Richmond—Whereas, The governor of the state of Indiana, by proclamation, has set apart and designated Friday, October 2, 1914, as Disease Prevention Day; and,

"Whereas, In said proclamation a direct appeal has been made to each and every citizen of the state to a proper observance of the same:

"Therefore, In accordance with said proclamation, let the citizens of the city of Richmond heartily co-operate with the state authorities in their efforts to better the health conditions of the state, and let the various organizations of our city and our public schools plan and arrange to take a part in this great movement, that the public conscience may be awakened to its duty in the elimination of every condition that is detrimental to the health of the people of our city."

Huge Cranes to be Used in Constructing Sewer.

Burlington, Iowa.—In constructing the new Market street sewer the work of wrecking the masonry outlet is being carried on rapidly by a large force of laborers. The Burlington railroad has a bridge gang at work on the tracks that cross the sewer and as soon as this bridging is completed modern machinery will be placed in operation to enlarge the sewer. Two, and possibly four, great locomotive cranes will be placed on tracks that will parallel the sewer, and equipped with automatic buckets these mechanical excavators will scoop out the earth in wagon load parcels. One of the new cranes has already arrived, having been purchased by the Burlington Sand & Gravel Company from the Brown Hoisting Machinery Company of Cleveland, Ohio. The new machine is twice the capacity of the old one that has been unloading gravel and sand from the barges at the plant at the foot of Market street. The new monster is mounted on a double truck frame and

will lift a weight of twenty tons. It will switch its own cars, lay its own tracks, picking up the rails from the rear and swinging them around to the front, doing away with the necessity of a gang of men. It cost \$7,000. The new sewer, or the enlarged one, will be 2,200 feet long and will cross the tracks in the railroad yards on Market street. In a few weeks the cranes will be in operation, working from each end of the sewer. These cranes will not only dig the ditch but will handle the material for the concrete work and after the tunnel has been completed will replace the dirt about the concrete tube. G. A. Begeman, of the Burlington Sand & Gravel Company, will have charge of the construction work on the sewer. The contract for the work is in the hands of Young & Buescher. The sand and gravel company will erect a new screening plant on its grounds and automatically screen the gravel in grades suitable for chicken feed, plaster work and coarse enough for the heaviest concrete work.

WATER SUPPLY

Baltimore Faces Water Famine.

Baltimore, Md.—Aroused over the possibilities of a water famine, Mayor Preston sent a letter to the Board of Police Commissioners asking them to enforce the laws regulating the use of and waste of water. (So far there have been no arrests because of such violations, but the police have been ordered to be vigilant.) With the water situation in the city extremely grave, Mayor Preston issued an appeal to the public in which he asks everyone to be as careful as possible in conserving the supply. The Mayor has been in daily conference with Water Engineer Clemmitt. He is aware of the problem that is now taking serious shape and says that if nature does not come to the aid of the city with heavy and protracted rains, the people will find themselves in an embarrassing situation. The Mayor further took steps to curtail the use of water in public institutions when he summoned Bernard J. Lee, Warden of the City Jail, to his office and ordered the Warden to reduce the jail's consumption. It is said that of about half a million gallons of water used in the institution daily, the button factory consumes about 150,000 gallons. Water Engineer Clemmitt said that the company operating the factory gets the water free, but now it is likely that the city will install a meter and make a charge, which, under the meter rate, would bring a revenue of about \$14 a day, or \$5,000 a year. The Mayor urged that the work on the Loch Raven dam be pushed to completion without delay, and Mr. Clemmitt said he would carry out the orders, but that he could not complete the work until a bit of new road about a quarter of a mile long could be built. The City Solicitor is now working on the proposition of acquiring the land necessary to be flooded.



BROWNHOIST CRANE DUMPING SAND.

Claim Highest Water Consumption.

Waukegan, Ill.—The claim that the city of Waukegan has the greatest consumption of water per capita has been contested by Evanston. Waukegan claimed to be using over 4,000,000 gallons daily, which represents the daily usage of 300 gallons per capita. Evanston now claims that it takes 400 gallons every day for every Evanstonian. The various city officials both of Evanston and of Waukegan maintain that the excessive use of water is due to waste on the part of the citizens. Waukegan is a manufacturing town, and many factories are drawing water from the city mains, while the city of Evanston is, as a whole, a residential district. That the excessive use of the water in the local factories was in a large measure the cause of the great consumption of water in the city this summer is known. The head of the water department in Evanston states that as the plant has been pumping water at the rate of 15,000,000 gallons a day, which is far above the capacity of the pumping station. The filtering system in that city has a capacity of 12,000,000 gallons.

All New Services to Be Metered.

Lafayette, Ind.—Hereafter the city of Lafayette will install no new water service except with meter. The new order has gone into effect and no exceptions will be made. Melville W. Miller, superintendent of the waterworks, said furnishing water at a flat rate does not give any protection against flagrant waste. It is probable that eventually all water service in the city will be put on the meter system. The city has adopted the outdoor meter with fireproof box. This permits the reading of the meters without entering a house. The city, under a new rule, is putting in a water service for \$16.10 and allowing the new patron credit for this amount on his water bill. The cost of installing a meter and box is estimated at about \$15. The city has bought a large number of meters and boxes and is selling them at cost, the meters selling for \$7 instead of \$12.50, the old price. Mr. Miller says the waste of water is appalling, and he expects the meter system to do away with this evil. Under a ruling of the public service commission the city hereafter will charge schools, public and parochial, at the rate of 10 cents a thousand gallons for water. Benevolent institutions and hospitals will be charged at the rate of 6 cents a thousand gallons.

Investigate Detroit's Water Supply.

Detroit, Mich.—The International joint waterways commission will open hearings in Detroit September 29 on the question of the pollution of the Detroit River, and the authorities of this city will be invited to appear at that time to submit such plans as they may have devised to remedy what defects in the water supply may exist. Mayor Marx has been notified from Washington.

New Main Completed.

Atlantic City, N. J.—Commissioner Harry Bacharach of the water department, Superintendent L. Van Gilder, T. Chalkley Hatton, consulting engineer, and James L. Ferebee, resident engineer, are being congratulated on the completion of the new 48-inch water main across the meadows at a cost of \$35,000 less than was originally estimated. The bond issue disposed of for this improvement amounted to \$450,000, and to date but \$38,479.57 has been expended. To this must be added \$24,396.50, the cost of the siphon across the thoroughfare, which has not yet been completed. Mr. Bacharach stated the entire contract would not amount to over \$415,000. Engineer Ferebee has kept in close contact with every inch of the work. Mayor Riddle proposed that the balance of the bond issue, amounting to \$35,000 be diverted to use in the construction of the new dam around the water supply pond at Doughty's Pond. It is proposed to turn this back into the sinking fund and then borrow it.

In carrying on this work the city furnished all pipe, specials and valves, delivered in Atlantic City, and contracts were let for the pile and concrete foundation and the placing of the pipe, specials and valves and other appurtenances. The first contract was for approximately 6,000 feet and the second contract for approximately 17,000 feet of 48-inch main and 1,500 feet of 30-inch main, to-

gether with valve houses and manifold connections. The combined cost of the pipe line was:

Pipe and Specials.....	\$191,888.50
Valves	10,545.00
Final Estimate of Contractors.....	170,483.36
Engineering	6,300.64
Inspection	5,879.27
Advertising, Printing and Legal.....	1,339.00
Extra work and material.....	3,043.80
Total cost.....	\$389,479.57

In addition there is yet the siphon across Beach Thoroughfare which is not completed. The contract price for this work is \$24,396.50.

Fort Worth's New Reservoir Completed.

Fort Worth, Tex.—The 35,000,000-gallon reservoir has just been completed and is now filled. The dam is 60 feet high and the water is now about 5 feet from the top. Waterworks Commissioner Blanke says the dam is in perfect condition and there is absolutely no danger of it breaking. There were about 24,000,000 gallons of water in the reservoir at the time of inspection. Mr. Blanke said the city will save about \$37,000 in fuel for pumping water and about \$10,000 in salaries every year after the reservoir water is put into use. He expressed the opinion, however, that the filtered reservoir water will never be as pure as the artesian water now being used. He will pump the artesian water as long as the supply holds out. When he is unable to get a sufficient supply of artesian water, he said he would use the filtered reservoir water. Mr. Blanke said that the completion of the reservoir would not allow the discontinuance of the operation of any of the five waterworks plants, except possibly the Powell plant, which is never used except about five months in the year. He said that if a new system of water mains is installed that one or more of the plants could possibly be dispensed with. The conduit line from the reservoir to the city has never been completed, but it will probably be next summer before the water in the reservoir is in condition to use. It will be drained off several times before run through the filtering plant and pumped into the mains.

Lay High Pressure Pipes at Night.

Boston, Mass.—Laying of the high pressure pipes at night in order to cause the least inconvenience to traffic, is the order given Commissioner Rourke by the mayor, after a prolonged study of the expected conditions in all the narrow streets and alleys of the down-town section included in the fourteen-mile route. This is the first time for many years that night work has been resorted to on any extensive street work where car traffic has not been involved. Though the expense will be a great deal heavier, the mayor believes that the results will justify the means and that the contractor will be willing to shift the hours of his force in the interests of the city. It is the plan to push this work of four miles of pipe laying this autumn as rapidly as possible. Commissioner Rourke will have a large force of his own inspectors on the streets to see that the best possible conditions for traffic are observed. When night work is concluded, the contractor will board up the open stretches for the safe passage of traffic during the day.

With the station finally decided on at Fort Point Channel, not far from the South Station, the engineers have been obliged to make rather troublesome changes in the route. All is now completed, however, and the contractor is enabled to begin work without fear of further revisions that would mean the practical abandonment of the work this year. The contractors are Long, Little & Russo and the amount of the contract is \$100,000, the mayor, however, stating that it would not be surprising if the first section cost double that amount, in view of the difficulties involved. The contract has been held up so long that the city has been threatened with a case in court. The contractor claimed that his damages amounted to \$12,000, but the mayor directed a settlement rather than submit to longer delay in beginning the work. In consequence, the city will settle at \$9,000. It also has been discovered by the mayor that the city has been paying the New Haven Railroad at the rate of \$5,000 a year for about two years for

the storage of pipes and other material to be used in establishing the system, all on account of the agitation over the location of the station, and despite the fact that the city owns plenty of unoccupied land that could as readily have been used for storage purposes. How much inconvenience to traffic the laying of the pipes will occasion is still a problem. Though the contractor must be given wide latitude in doing the work, every effort will be made to keep the streets open to vehicular traffic and the fire apparatus at the most congested centres. Besides, the contractor is urged to employ as many of the idle longshoremen as possible.

Rate Increase Granted.

Indianapolis, Ind.—Practically for the first time since its creation, the Indiana public service commission has allowed a general increase in rates for a public service corporation. The commission decided the case in which the Greencastle Water Works Company, a private corporation, had asked to be allowed to increase its rates on the ground that the existing rates were inadequate to pay proper returns on the value of the property. The action of the commission will enable the annual income of the company to be raised from \$18,128.36 to \$22,500. The company will be allowed to charge private consumers 40 cents for one thousand gallons of water, instead of 30 cents, the existing rate. The commission also allowed rates for fire hydrants to be increased from \$43 a year to \$50 a year. The commission put all services on a meter basis. It ordered the elimination of all free services and established minimum monthly charges running from 50 cents for one-half inch connection to \$6 for a six-inch connection. The commission established a valuation on the company's property of \$150,000, and said the income under the increased rates would be sufficient for the operating expenses and to pay 6 per cent. on the appraised value of the company's property.

STREET LIGHTING AND POWER

To Extend Ornamental Lighting System.

Niagara Falls, N. Y.—Mayor Laughlin, Works Commissioner Colpays and J. E. Montague, general manager of the Buffalo and Niagara Falls Electric Light and Power Company held a conference for the purpose of extending the decorative lighting system from Falls street along Third to Main and along Main to connect with the north Main street system at Michigan avenue. Mr. Montague assured the city officials that the power companies would furnish electricity for the lights free, and that his company would transmit current without charge. This is the same arrangement under which the Falls street and the north Main street systems were installed. The property owners and the city will divide the cost of extending the system, which will be about \$20,000.

City Gas Wells Exhausted; Propose Water Power Plant.

Coffeyville, Kans.—Since the gas wells, drilled several years ago by the city, to provide a fuel supply for the municipal water and light power plants have become nearly exhausted the city's monthly fuel bill has become quite an item. The bill for last month amounted to more than \$1,500. It has set the city officials to figuring on plans for the reduction of this expense, and may promise to result in the building of a water power plant at the big cement dam across the Verdigris river directly below the water works pumping station. It has been estimated that the flow of water over the dam would furnish power for both the water and light plants at least eight months out of the year at comparatively no cost to the city. Such a saving, in the opinion of Mayor Curry, would soon pay for the construction of a water power plant at the dam.

Test Nitrogen Filled Lamps.

Youngstown, Ohio.—The new nitrogen lamps, which have been installed about the court house by County Electrician George Eagleston have been given their first trial and proved successful. The lights are of the type which the city is investigating for street lighting purposes and the county's experiment is being watched with interest.

There are 40 lamps in use, five in each of the eight electroliers about the building. The lamps at the top of each cluster are twice as powerful as the four beneath them and the vicinity of the county building is brilliantly illuminated.

FIRE AND POLICE

Want Lower Insurance Rate.

Bristol, Tenn.—A fight is to be made in Bristol for lower insurance rates. The city has invested approximately \$16,000 in modern fire fighting apparatus, which has materially reduced the loss by fire in Bristol. However, the rates remain the same. Mayor J. H. Faucette states that the fire risk has been cut down and that the people are entitled to better rates. He is demanding to know why property in Bristol, Tenn., all takes a rate 25 per cent. higher than in Bristol, Va., when the former city has 1,000,000 gallons more water ever twenty-four hours.

Injuries at Louisville Fire.

Louisville, Ky.—Six injured, \$85,000 damages and a historic building destroyed, are the results of a Louisville fire. The fire was burning through the roof and enveloped the entire theatre building when Chief Timothy Lehan and his men reached the scene. Three firemen and three others were injured by falling walls, and people had to be rescued from the flames. The illustration shows the fire engine and water tower at work.

MOTOR VEHICLES

Boyd Triple Combinations Tested.

Covina, Cal.—Shipment has just been made by James Boyd & Bro., Inc., Philadelphia, of a new triple combination, 700-gallon pump, to the City of Covina, Cal. This is one of the Boyd Company's type PB cars, with a six-cylinder, 5¾ in. x 6½ in. motor. The machine was put through a number of severe tests before leaving the factory and made a remarkable showing. At the factory test, under underwriter's conditions, from a 15-ft. lift, the machine pumped 780 gallons. This machine will be one of the handsomest pieces of apparatus on the Pacific Coast, being painted pure white, with gold striping. It is equipped with pneumatic tires, has a steel hose body, capacity of which is 1,200 feet of fire hose.



Courtesy Louisville (Ky.) Times.
WATER TOWER AT WORK.

Stowe, Pa.—The West End Fire Company, of Stowe, has just received a new triple combination from James Boyd & Bro., Inc., of Philadelphia. The new machine was put through a severe acceptance test, and pumped at three plugs. The stream was thrown twenty-five feet over the Stowe High School at 160 pounds pressure from a plug. The citizens of Stowe, and members of the fire company are very proud of the new car, which is equipped with solid tires, a 35-gallon Holloway tank, and a hose body with a capacity of 1,200 feet of fire hose.

Salem's New Engine Tested.

Salem, Mass.—The new Robinson auto combination pumping engine, hose and chemical wagon, made by the Robinson Fire Apparatus Mfg. Co., St. Louis, Mo., purchased for \$8,400 and an old hose wagon, was given its official test before the fire fighters from this entire section and more than made good on its guarantee, delivering more than the specified amount of water. The machine will be placed in commission immediately.

Receives New Police Patrol.

Joplin, Mo.—A new police motor patrol purchased by the city at a cost of \$2,950 has arrived. The machine is a Cadillac and was ordered through the Greenlease Motor Company. The auto is a combination of patrol and ambulance.

Key West Has New Combination.

Key West, Fla.—The Key West fire department is being motorized rapidly. The No. 1 station has just received from the American-La France Fire Engine Company a combination pumping engine and hose wagon, which is the second of four new apparatus that have been ordered by the city and county authorities. It has a capacity of throwing 700 gallons of water a minute. The city and county are spending \$20,000 on the fire department.

GOVERNMENT AND FINANCE

Mayor Mitchel Wants Central Purchasing Agency.

New York, N. Y.—Mayor Mitchel has sent to the Board of Estimate the tax budget for \$60,924,057 for the twenty-nine departments under his direct jurisdiction for 1915. This is perhaps the first time that a New York executive has revised the budget prior to submission to the board. Mayor Mitchel feels that his revision is in line with his policy of coordinating all the departments. Some of the Mayor's efforts to secure improvement in organization have been frustrated by the failure of the legislature to grant necessary powers. The city is therefore still obliged to purchase the \$14,000,000 to \$15,000,000 of supplies bought each year through several scores of purchasing agencies, when every one is agreed that a central purchasing agency along the lines followed by large corporations will affect vast economies. The Mayor was denied by the legislature authority to organize in the Mayor's office a Division of Administration to assist in caring for the multitude of details and working out better methods for carrying on the general business of the city that is not the peculiar function of any one department, but which must receive attention if efficient administration is to be obtained. The work of next year has been planned without increasing the aggregate cost of the departments to taxpayers, notwithstanding added duties imposed upon by legislation, the growth of the city, and the widening of important social service. The request for 1915 is summarized as follows:

Department.	Request, 1915.
Accounts, Commissioner of.....	\$ 266,690.09
Ambulance Service, Board of.....	82,147.00
Assessors, Board of.....	42,088.50
Bridges.....	834,407.23
Chamberlain.....	58,110.00
Charities.....	4,014,983.36
City Record, Board of (city).....	998,868.00
Correction.....	1,362,775.93
Docks and Ferries.....	2,392,640.35
Examining Board of Plumbers.....	3,814.00
Fire.....	9,283,226.02
Municipal Explos. Commission.....	
Health.....	3,629,240.50
Inebriety, Board of.....	9,989.65
Law.....	850,360.00
Licenses.....	183,567.00

Mayor.....	64,078.00
Municipal Civil Service Com.....	218,470.00
Park Board.....	31,249.00
Parks—	
Manhattan and Richmond.....	1,097,544.29
Brooklyn.....	813,959.27
Bronx.....	453,617.51
Queens.....	180,130.29
Parole, Board of.....	8,645.00
Police.....	17,335,316.31
Public Recreation Commission.....	
Street Cleaning.....	7,819,599.50
Taxes and Assessments.....	590,012.50
Tenement House.....	725,898.50
Water Supply.....	7,567,802.35
Weights and Measures, Bureau of.....	74,832.50
Total.....	\$60,924,057.69

Advocate Commission Government.

Passaic, N. J.—Those anxious to see commission government under the Walsh act adopted by all the boroughs, townships and villages in Bergen County will soon start an active campaign to show the results obtained under the commission form in other counties during the coming political campaign. Commissioner George F. Brensinger, now acting mayor of Jersey City, will visit Hackensack, Englewood, Rutherford, East Rutherford and Garfield, telling the people how successful commission government has been in reducing expenses in Jersey City. There are only two municipalities in which the commission form of government has been adopted in Bergen County.

Favor Commission Against City Manager Form.

Torrington, Conn.—By a vote of four to two, the straight commission form of government, twice favored by the voters in special town meetings, has been adopted at the meeting of the charter committee held at the office of Judge Gideon H. Welch, chairman, over the proposed Dougal amended form of a city manager plan. The victory for the straight commission form of government was most popular, for from the time the "city manager" plan was suggested the hand of the "politician" was seen in the work, threatening disaster to the whole proposition.

Ask for Commission Government.

Frankfort, Ky.—Petition for a vote at the November election on the question of adopting the commission form of government for Frankfort under the act of 1914, has been filed with County Judge Hieatt. The petition contains 484 names, considerably more than the per cent necessary to secure the election.

MISCELLANEOUS

Kansas City Flooded.

Kansas City, Mo.—Many sections of the city were under water early last week because of the overflowing of Turkey Creek. Three thousand homes, it is estimated, were flooded and several hundred families were driven from their dwellings. Despite the fact that the water was receding, there was much danger from collapsing buildings. Two men were killed when they came in contact with a broken trolley wire, a number were injured slightly, and numerous rescues are reported. The total loss is estimated at \$1,500,000. Telephone service throughout the city was demoralized and street car service was suspended in many sections. Within 11 hours 6.94 inches of rain fell—the biggest rain storm ever recorded in Kansas City.

Municipal Markets for Chicago.

Chicago, Ill.—Chicago has learned a lesson from New York on how to cope adequately with "war time" food prices. Four municipal markets have been opened in the eastern city. Prices at which commodities were sold in the market showed a great decrease compared with prices quoted in the retail stores of Chicago. It was pointed out that the fact that New York was ahead of this city in the establishment of public market places was not the fault of the Chicago municipal markets commission, as that organization more than two months ago recommended that Chicago open five such markets.

London Makes Employees' Uniforms.

London, England.—As bids for uniforms range from 15 per cent to 60 per cent more than last year's prices, it is stated that the London County Council proposes to buy cloth direct from the manufacturers and get it made up.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Contracts—Resolutions.

Harrold v. City of Huntington.—A resolution passed by a city council awarding a contract for street improvement will be presumed to have received the necessary two-thirds majority vote of councilmen present at the meeting, when the minute contains no record of the vote.—Supreme Court of Appeals of W. Va., 82 S. E. R., 476.

Lake Water Supply—Pollution Forbidden.

City of Battle Creek v. Gognac.—Where the owner of land abutting on a lake sold part of it to a municipality as a site for a water plant, by which the municipality was to supply its inhabitants with waters from the lake, held by an equally divided court that both the owner and his subsequent grantees were estopped from using the lake in such a manner as to pollute the waters and render them unfit for drinking purposes.—Supreme Court of Michigan, 148 N. W. R., 441.

Public Improvements—Injuries to Abutting Property.

Mayor and City of Baltimore v. Stalfort.—A declaration, in an action against a city for injuries by water, which alleges that the city tore up an open gutter in front of plaintiff's premises for the construction of a sanitary sewer, and negligently reconstructed the gutter and relaid and repaved the same for the purpose of carrying off the surface water, and left and allowed to remain cracks between the rock used in paving the gutter, so that surface water percolated into plaintiff's house, demands a recovery for the negligent repaving of the gutter, and not for injuries from the negligent construction of the sanitary sewer or for injuries from the negligence in maintaining the open gutter in an unsafe condition.—Court of Appeals of Maryland, 91 A. R., 476.

Injury from Icy Pavement—Proof of Negligence.

Hibberd v. City of Philadelphia.—In an action for injuries to plaintiff, a man of advanced age, from falling on an icy pavement, evidence that the ice had been on the pavement for a week or ten days prior to the accident required that the question of the defendant city's negligence in permitting the ice to remain after constructive notice of its presence, be submitted to the jury, though plaintiff had testified in deposition previously taken that 2½ hours before the accident the ice was soft, but that at the time of the accident it was frozen over with water which came from a terrace; there being nothing in the deposition inconsistent with the other evidence as to the length of time the ice had been on the pavement.—Supreme Court of Pennsylvania, 91 A. R., 486.

Repealing Statutes—Time of Taking Effect.

Ahiel v. City of Philadelphia et al.—Where a revising statute is to take effect at a future period or upon the happening of certain contingencies or performance of certain acts, a clause therein repealing former laws on the same subject does not take effect until the act goes into operation.—Supreme Court of Pennsylvania, 91 A. R., 491.

Contract for Water Supply—Construction.

Millville Water Co. v. City of Millville.—In 1879 the city of Millville agreed with the Millville Water Company that, if the company would erect a plant and do all things necessary to supply the city with water, the city would take such supply, and would annually, in compensation therefor exempt the water company "from the payment of all taxes except those levied for state and county purposes." In 1912, in violation of this agreement, the city having received its water supply, compelled the water company to pay the tax due to the city for that year. Thereupon the water company sued the city for the price of the water so furnished, fixing in its complaint such price as the amount of

the tax so paid. On a motion to strike out this complaint on the ground that the agreement to exempt from payment of taxes was void as against public policy, held that, as between these contracting parties, the true construction of the agreement was that the city would pay for the annual supply of water furnished to it by the water company a sum equal to the amount of the tax payable for that year by the water company to the city.—Supreme Court of New Jersey, 90 A. R., 1,097.

Sewage—Public Nuisance—Right to Enjoin.

Smith, et al., State Board of Health, v. City of Silverton.—A city has no right, without legislative authority, to cast its sewage into a stream, so as to pollute it to the injury of lower riparian proprietors, unless it has first condemned the interests injuriously affected. Where the casting of sewage into a stream amounts to a public nuisance or a taking of private property in the constitutional sense, the city is not protected or justified in such appropriation, unless it has acquired the right by condemnation and payment of compensation. The right granted to a city by its charter to construct sewers does not give implied authority to pollute a stream. The right of the state to enjoin a nuisance may be delegated to and exercised by a city or other power specially named for that purpose.—Supreme Court of Oregon, 162 P. R., 609.

Power to Close Streets.

Stevens v. City of Dublin et al.—The general powers of a municipality to control, alter, widen, etc., and, in the interest of public safety, to temporarily close a street do not authorize a permanent closing of a public street to the damage of an abutting owner.—Court of Civil Appeals of Texas, 169 S. W. R.

Compensation for Extra Work—Obligation to Pay—Evidence.

Longstreth et al. v. City of Philadelphia et al.—A city is under no moral obligation to pay a contractor anything additional for alleged extra work where he has been fully paid under the terms of his contract for everything done by him. In a contractor's action against a city for compensation for alleged extra work, a finding that he had been paid under his contract for all work done could not be disturbed on appeal, when sustained by evidence.—Supreme Court of Penna., 91 A. R., 667.

Use of Streets by Abutting Owners—Construction of Vaults.

Appleton et al. v. City of New York.—Where an abutting owner must apply to the city for a permit for the construction of vaults beneath the surface, and the city exacts an unreasonable fee therefor, the owner may, by mandamus or otherwise, compel the granting of a permit on payment of a reasonable fee for the expenses to which the city may be subjected by supervising the construction of the vaults and the inspecting of them to make the street safe for travel. Where a city owns the fee of a street, a permission to construct a vault beneath the surface of a street by the abutting owner is a revocable license, and when the public interests, whether for street uses or other public purposes, require the use of the space of any part thereof in which a vault has been permitted, it must revoke the permit.—Supreme Court, Appellate Division, 148 N. Y. S., 872.

Use of Streets—Public Hack Stands.

Waldorf-Astoria Hotel Co. v. City of New York et al.—A city may, by virtue of its power to regulate the use of streets and sidewalks, and to regulate hackmen and so forth, provide for public hack stands in the streets, and prescribe the length of time that hackmen may stand thereat; but it cannot authorize an interference with the right of ingress and egress to and from abutting property. A provision in an ordinance authorizing the establishment of public hack stands in the streets adjoining hotels and other buildings, that a space of at least 30 feet opposite the entrance to the adjoining building shall be kept free from standing hacks, cannot be said to be, as matter of law, so unreasonable an interference with the right of ingress and egress as to render the ordinance void.—Court of Appeals of New York, N. E. R. 803.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Sept. 19-20.
CONFERENCE INTERNATIONALE A LYON.—L'Union Internationale des Villes and l'Union des Associations Internationales, Lyons, France.

Sept. 21-25.
ILLUMINATING ENGINEERING SOCIETY.—Eighth Annual Convention, Cleveland, Ohio. Assistant Secretary, Joseph Langan, 29 West 89th street, New York City.

Sept. 28-Oct. 3.
LEAGUE OF AMERICAN MUNICIPALITIES. Annual Convention, Milwaukee, Wis.

Oct. 6-9.
AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Annual Convention, Boston, Mass. Secretary, Charles Carroll Brown, Indianapolis, Ind.

Oct. 7, 8, 9.
LEAGUE OF KANSAS MUNICIPALITIES.—Lawrence, Kan. Secretary, C. H. Talbot.

Oct. 7-9.
MOTOR TRUCK CLUB OF AMERICA.—Annual Convention, Detroit, Mich. President, George H. Duck, New York.

Oct. 12 to 16.
AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Convention, Atlantic City, N. J. H. C. Clark, 29 West 39th street, New York City.

Oct. 14, 15.
ILLINOIS MUNICIPAL LEAGUE.—Annual Convention, Urbana-Champaign.

Oct. 20-23.
INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.—Annual Convention, Grunewald Hotel, New Orleans, La. Secretary, Mr. McFall, Roanoke, Va.

Oct. 21-23.
ALABAMA GOOD ROADS ASSOCIATION.—Nineteenth Annual Convention, Montgomery, Ala. Secretary, J. A. Rountree, 1021 Brown Marx Bldg., Birmingham, Ala.

Oct. 28-31.
NORTHWESTERN ROAD CONGRESS.—Annual Convention, Milwaukee, Wis. Secretary, J. P. Keenan, Milwaukee.

Nov. 9-13.
FOURTH AMERICAN ROAD CONGRESS.—American Highway Assoc. and American Automobile Assoc., Atlanta, Ga. Secretary, J. S. Pennybacker, Colorado Building, Washington, D. C.

Nov. 18-20.
WASHINGTON STATE GOOD ROADS ASSOCIATION.—Spokane, Wash. Secretary, M. D. Lechey, Alaska Building, Seattle, Wash.

Dec. 2, 3, 4.
CITY MANAGERS' CONVENTION.—Springfield, Ohio. C. E. Ashburner, City Mgr., Springfield.

Dec. 14-17.
AMERICAN ROAD BUILDERS' ASSOCIATION.—11th Annual Convention; 5th Annual Good Roads Congress, and 6th Annual Exhibition of Machinery and Materials, International Amphitheatre, Chicago, Ill. Secretary, E. L. Powers, 150 Nassau st., New York, N. Y.

Feb. 10-17, 1915.
EIGHTH CHICAGO CEMENT SHOW.—Coliseum, Chicago, Ill. Cement Products Exhibition Co., J. P. Beck, General Manager, 208 S. La Salle Street, Chicago, Ill.

Convention of the American Society of Municipal Improvements.

The American Society of Municipal Improvements will hold its next convention, the twenty-first, at Boston, Mass., on October 6, 7, 8 and 9. This will be the first convention which has ever been held in New England, and, what is even more important, the first since the union of this society and the Association for Standardizing Paving Specifications. This union of the two societies was authorized by each of them at their 1913 conventions, and was effected last fall through committees of the two societies authorized to take this action. A considerable number of city officials are members of both societies, so that the combined membership is not nearly as great as the sum

of the membership of the two societies. The Association for Standardizing Paving Specifications, however, brought to the older society a net increase of forty-five individual members, in addition to which there are ten cities admitted as municipal members which had not, at the time of publication of the Proceedings a few weeks ago, appointed any personal representatives in the society. As most of the other cities have appointed four delegates, a similar number from each of these would bring the net increase to forty additional, or a total of eighty-five, less such number of these delegates as already may be members of the society.

More important to municipal interests is the fact that the amalgamation of these societies combines practically all of the organized interests which have for several years been working to prepare and introduce standard specifications for the various classes of street paving. The several committees of the two societies had been working in harmony with more or less co-operation, but there were still some differences between the specifications adopted by the two. It seems probable that at this year's convention final decision will be made on a single set of specifications for all of the more common classes of street paving, which will then have behind them the combined influence and support of the united societies.

The public meetings of the convention will begin on Tuesday at 10 a. m., when Mayor James N. Curley will give the address of welcome. Tuesday afternoon and evening will be occupied with the reading and discussion of papers and reports of committees, and business meetings of the society. On Wednesday afternoon the delegates and guests will be taken in the city boat "Monitor" on a trip down the harbor, during which the city will furnish a luncheon, the boat starting at 1.30 p. m. Wednesday evening will again be devoted to a business meeting, as will Thursday morning. On Thursday afternoon there will be an auto ride through Boston and vicinity to inspect the historical points and construction work and engineering features of interest to municipal officials; this ride starting from the Hotel Somerset at 2 p. m. These two excursions will be the only portions of the convention period devoted to anything other than business meetings, it being a special request of the society as expressed at the 1913 convention that no more time than this be taken up with what are known as entertainment features. This certainly speaks well for the serious purpose of the society—a characteristic of all its conventions which those who have attended them have noted.

In addition to the entertainment for the members, provision will be made

for seeing that the wives and daughters and other ladies of the party are kept entertained while the delegates are busy in the convention hall.

A very interesting program of papers and committee reports has been prepared, and a considerable percentage of the papers are being printed for distribution before the convention, and will be received by the members in a very few days.

The headquarters of the society will be the Hotel Somerset, at Commonwealth avenue and Newbury street, at which hotel will be held the business meetings, committee meetings, technical discussions, etc., and where also will be given an exhibit of materials and appliances used in municipal work.

National Paving Brick Manufacturers' Association at Buffalo.

The eleventh annual convention of the National Paving Brick Manufacturers' Association met at the Hotel Statler, Buffalo, N. Y., Sept. 9-11. The first day was given over to registration and business meetings, while inspection trips over brick pavements in the surrounding country took up the other two days. On Sept. 10 the association gave a banquet to its guests and friends. The total registration of the convention was about 300—the largest attendance at any convention ever held by the society.

On Sept. 9, a special committee on election and admissions was elected, consisting of Will P. Blair, chairman; C. C. Blair and Mr. Barker. Following this was a short address by the president, Charles J. Deckman, and talks by Will P. Blair, secretary, and H. H. McDonald, assistant secretary. In his talk, Mr. Blair gave a short outline of the work done by the association during the past year and showed the benefits derived from membership in it.

The conference with the Brick Committee of the American Society for Municipal Improvements was held in the evening. After a long discussion the members of the committee, E. H. Christ, J. H. Sullivan, Henry Maetzel, H. W. Klousman, F. J. Cellarms and J. A. Vanderwater, were instructed to draw up a resolution favoring the adoption of factory inspection for paving brick.

On Sept. 10, eighty cars carrying members, guests and friends started on the first inspection trip, the purpose of which was the study of brick pavement construction on country highways.

The convention banquet was held at The Statler Hotel in the evening. George C. Diehl, chairman of the Good Roads Committee of the A. A. A., acted as toastmaster. A. D. Gast, chairman of the Illinois State Highway Commission, was the first speaker. He outlined present road conditions in Illinois and explained the new road system which is to be built at a cost of 180 million dollars. Prof. M. A. Baker, of the University of Illinois, spoke on the new Illinois highway law. C. C.

Brown, secretary of the Good Roads Federation of Indiana, told of the road conditions in Indiana and explained how, owing to a court decision, brick paving could not lawfully be laid by the state of Indiana. W. M. Acheson, Engineer in charge Div. 9, N. Y. State, was the next speaker. In his talk he gave his experience with brick pavement for country highways and stated that in addition to the roads already completed and under construction, authorization for the construction of an additional 40 miles had just been received. Poor grouting and poor foundations were, he said, directly responsible for nearly all the failures of brick paving that he had observed. He attributed 70 per cent of the failures to poor foundations. Following Mr. Acheson, Mr. Emory, E. H. Christ, S. W. Jackson and Prof. Leonard Smith, of the University of Wisconsin, spoke. Prof. Smith told of the European roads and stated that, in his opinion, maintenance was the principal thing in all road work. He also explained the method of road finance in Wisconsin. Talks on road work by Prof. Edward Crey, of R. P. I., and by E. A. Fisher, of Rochester, closed the speaking for the evening.

The inspection trip was resumed on Sept. 11, the route as laid out going through Niagara Falls, Lewiston and Youngstown to Old Fort Niagara.

The following officers were chosen:

President—Charles J. Deckman, Cleveland.

Vice-President—J. W. Robb, Clinton, Ill.

Treasurer—C. C. Barr, Streator, Ill.

Secretary—Will P. Blair, Cleveland.

Assistant Secretary—H. H. McDonauld, Cleveland.

There was no contest for any of the offices.

American Highway Association.

Legislation, finance, engineering and other distinctive lines of activity will engage the attention of great national organizations such as the American Highway Association, the American Automobile Association, the American Bar Association, the American Bankers' Association and the National Civil Service Reform League, during the sessions of the Fourth American Road Congress at Atlanta throughout the week of November 9th.

A conference of the official heads of the various State Highway Departments and the United States Office of Public Roads, will be held at some time during the course of the sessions to consider questions of mutual interest to the Highway Departments. A number of the states have gone extensively into the building of trunk line systems through large bond issues, notably New York, with an actual and contemplated outlay of \$100,000,000. California, \$18,000,000; Massachusetts, about \$14,000,000; Maryland, actual and contemplated, about \$18,000,000, and other States in smaller amounts. The methods followed and the results obtained will be carefully analyzed.

Other states, among them Virginia, Georgia, Colorado and Washington, have gone extensively into the use of state convicts for road work. The states of New York and New Jersey are now experimenting along these lines, while many others are studying the problem. Convict labor will, therefore, be another one of the many subjects to be discussed at the Congress. The general program carries the names of twenty-six chief officials of Highway Departments representing the States of Maine, New Hampshire, Connecticut, New York, Pennsylvania, New Jersey, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Louisiana, Arkansas, Oklahoma, Kentucky, Ohio, Michigan, Illinois, Minnesota, Iowa, Colorado, Washington, California, and the Federal Government. It is expected that by the time the final program is issued, not more than one or two states will fail to be represented by the actual official heads of their Highway Departments. These technically trained specialists will deal with all of the problems of construction, maintenance, and management of public roads.

NEW ENGLAND WATER WORKS ASSOCIATION

The thirty-third annual convention of the New England Water Works Association met at Boston on Sept. 9-11. More than four hundred members registered.

After Mayor Curley opened the convention with an address of welcome, the business of the association was immediately taken up. Frank A. McInness read a report of a committee on "Standard Specifications for Cast Iron Pipe," and an important paper on "Statistics of Filter Operations" followed, read by Chairman George C. Whipple.

Allen Hazen, chairman of the committee on "Meter Rates," read a report on the subject of measuring water for municipal income. His report advocated a standard schedule for metering the water, with a sliding scale of rates and a service charge. The report deprecates the present common use of two units of measurements, gallons and cubic feet, and asks that a discussion as to the relative value of the two be taken up.

Other members of the committee making this report were Charles R. Bettes, A. E. Blackmer, A. W. Cuddeback, James L. Tighe and Philander Betts.

At the afternoon session, Frederic P. Stearns, chairman of another special committee, read a report on "Low Yields of Catchment Areas in New England." The committee was appointed early in 1911 on account of the low flow of the streams during the years 1908, 1909 and 1910. The year 1911 proved to be even drier than the preceding years, and 1912 and 1913 nearly as dry.

An interesting fact that caused dis-

cussion was the statement that the average yield of the Wachusett drainage area in this state from 1897 to 1907 was 1,212,000 gallons per day, per square mile; while from 1908 to 1913, the average has fallen to 841,000 gallons. The highest yield during the past six years was a little less than the lowest yield during the preceding years.

Other papers read during the day were as follows: "Electrolysis," by E. B. Rosa, chief physicist, bureau of standards, department of commerce, Washington, D. C.; "The Construction of Dams," by A. E. Walden, superintendent and chief engineer the Baltimore County Water & Electric Company of Baltimore, Md., and "Allowable Leakage from Water Mains," by E. G. Bradbury, an engineer, of Columbus, O.

In the afternoon the following papers were read: "The Automobile as an Efficiency Agent in Water Works Management," by George W. Batchelder, Water Commissioner, Worcester, Mass.; "House Boiler Troubles," by F. F. Forbes, Supt., Brookline, Mass.; "Water Uses Difficult to Control," by Wm. F. Sullivan, Supt., Nashua, N. H.; "Care of Gates and Hydrants," by Patrick Gear, Supt., Holyoke, Mass.

Two papers were read in the evening: "Metering an Old City," by James A. McMurry, Engineer in Charge Income Branch, Water Service, Boston; "The Miraflores Water Purification Plant," by George M. Wells, Div. Engineer, Gatun, C. Z.

A superintendents' session occupied the entire morning of Sept. 11, at which short papers and discussions were read. The papers were entitled: "Machine Calking of Lead Joints," by Daniel T. Higgins, Supt., Waltham, Mass.; "Public Watering Stations," by Frank E. Merrill, Comr., Somerville, Mass.; "Low Water Consumption in Milton, Mass.," by D. A. Heffernan, Supt., Milton, Mass.; "The Use of the Magnetic Dipping Needle in Locating Pipes and Gates," by Edward D. Eldredge, Supt., Onset, Mass.

In the afternoon a demonstration of street main cleaning was given. The work was done for the City of Boston by the National Water Main Cleaning Co., of New York. On Thursday at noon a section of about 700 feet of 6-in. water pipe was successfully cleaned. Transportations was provided to and from the site of the work on Conant street, near Huntington avenue, Roxbury, Boston. About eighty interested members witnessed the demonstration. Withstanding the postponement, several were on hand to see the second successful cleaning.

Openings in the ground and into the pipe were made at either end of the pipe being cleaned. By means of a special carrier device, cable was passed through the line and the cleaning machine attached to the end of the cable. By means of a windlass and this cable, the machine was drawn through the pipe, effectually removing all of the incrustation and dirt.

NEW APPLIANCES

DUMP TRUCK FOR CATCH-BASIN CLEANING.

A 7½-ton Mack Truck Equipped With Brownhoist-Swinging Crane.

The International Motor Co., West End Ave. and 64th street, New York, has delivered to the Bureau of Sewers, Borough of the Bronx, New York, a 7½-ton Mack Dump Truck, equipped with a motor operated crane for lifting buckets of sediment from sewer catch-basins and depositing contents in the body of the truck. The design of this equipment is claimed to be absolutely original. Heretofore it has been necessary for a gang of men to laboriously haul a small bucket of refuse from sewer manholes by hand process, or else use a tripod derrick which only slightly aided matters. With this 7½-ton Mack it is possible to run the truck alongside the curb, and with the swinging crane, raise a bucket of silt weighing 1½ tons above the sides of the body and dump it on board.

The truck has a special steel watertight dump body, with a capacity of 3½ cu. yds. The body is equipped with the Hunt Dumping device. As the material to be dumped is of a quality which offers considerable sectional resistance, the body is raised to an angle of 60 degrees. The hoist is manufactured by the Brown Hoisting Machinery Co., Cleveland, and consists of an upright about 8 feet above the floor of the truck, with an arm extending out which gives the crane an effective radius of 8 feet. This crane is operated from the clutch shaft and controlled by a lever which is directly behind the cab, within easy reach of the driver. It is possible to rotate the crane by hand so that material can be picked up from either side of the truck. The crane rotates from 200 to 220 degrees. With the propeller shaft revolving at 600, the crane has an effective hoist speed of 20 ft. per minute.

The wheelbase of the truck is 14 feet 6 inches; the front wheels, 36 inches, equipped with 36-in. by 6-in. Goodyear tires. The rear wheels are 42 inches, equipped with 42-in. by 7-in. dual Goodyear tires. The motor is a 50 H. P.

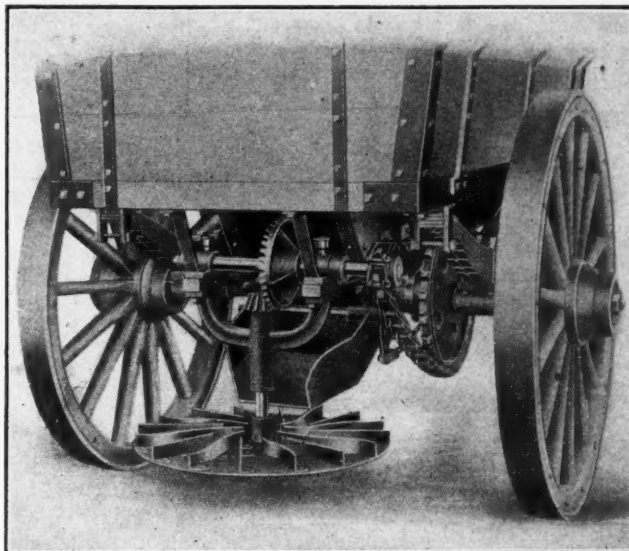
Mack. A truck of this type offers many possibilities. It can be designed with either a platform, rack, or dump body for carrying any commodity that can be picked up with grappling hooks or gathered up in a bucket or scoop. With the power crane it should make easy the handling of such diverse material as cut stone, castings, pipe, etc. The total weight of this truck, with a 6-ton load, does not exceed weight of a regular 7½-ton Mack dump truck loaded to capacity.

KINDLING SAND SPREADER.

This consists of a wagon, simple and strong in construction, the body of which holds the sand or gravel, which is distributed over the roadway automatically by a spreader. The sand or gravel flows from the bottom of the wagon body through a chute which discharges it upon the spreader.

The spreader consists of a circular horizontal plate carrying 16 approximately radial flanges on its upper surface. The plate is carried by a vertical shaft which is supported from the wagon body and is revolved by bevel gearing driven by the axle, which is

fastened to and revolved with the rear wheels, through a sprocket chain. The plate is only a few inches above the pavement and its revolution causes the sand to fly in all horizontal directions by centrifugal force.



KINDLING SAND SPREADING MECHANISM.

The width covered varies with the speed of revolution of the spreader and the material used, being generally between 20 and 60 feet. The amount of sand distributed can be controlled by the driver, who, by means of a lever at the right of his seat, can regulate the rate of flow of sand through the chute onto the spreader. Another lever throws in and out of engagement the clutch which transmits motion to the spreader.

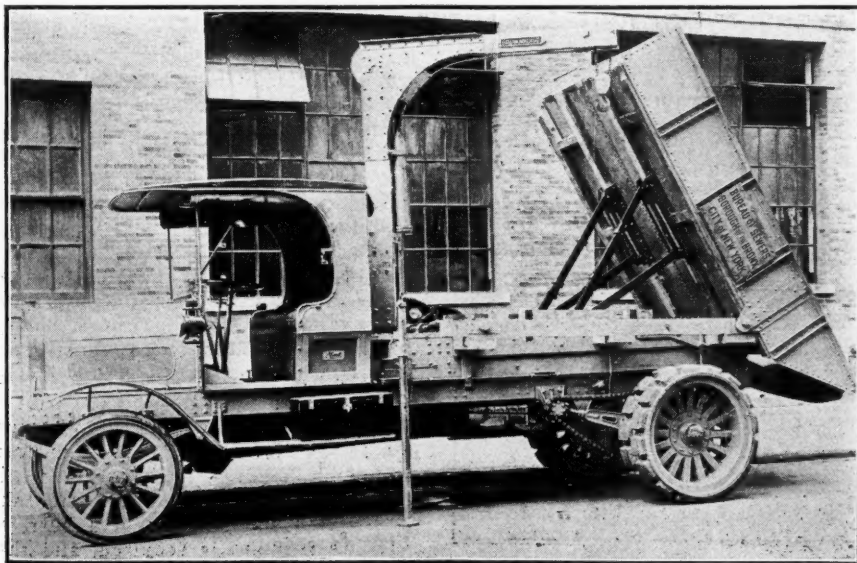
It is said that with this wagon 50,000 square yards of pavement can be sanded in one hour—an area which it would require 15 or 20 men to cover with shovels. Material varying from the finest sand to inch-and-a-quarter stone can be spread.

The use of this spreader is of course chiefly to reduce slipperiness on streets, either in icy weather or when covered with the slime which is caused by drizzles or fogs; or in some cases of naturally smooth pavements on steep grades.

This spreader is already in use by Chicago and Milwaukee and other cities. It is manufactured by the Kindling Machinery Company of Milwaukee.

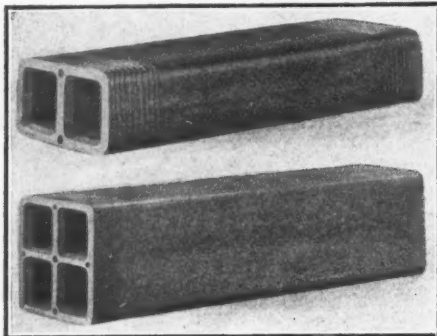
VITRIFIED TILE CONDUIT.

The increasing elimination of overhead wires has brought out many types of underground ducts for the carrying of all kinds of transmission lines. Vitified tile conduit buried in concrete claims a wide use and many advantages. Vitified salt-glazed duct affords adequate protection against moisture, gas, fire, water and temperature effects and also against the insidious electrolytic destruction due to



MACK DUMP TRUCK FOR CATCH-BASIN CLEANING.

contagious currents. American Vitrified Conduits, manufactured by the American Vitrified Conduit Co., Broadway-Maiden Lane Building, New York, is claimed to embody all the essential advantages of the material. The makers guarantee the duct against deterioration of time. The duct is claimed to have high insulating qualities and to give protection against electrolysis and induction. This duct is joined by dowel pins of special design, calculated to insure perfect alignment and to prevent shifting during laying or after and, in combination with the wrapper which is used around the joints, to



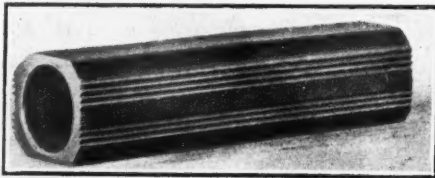
TWO AND FOUR-WAY DUCT.

make a true connection. The frictional resistance offered by the interior to wires and cables is claimed to be a minimum. The duct is held to need no repairs or renewals; to be easily accessible and to have initial strength against breakage.

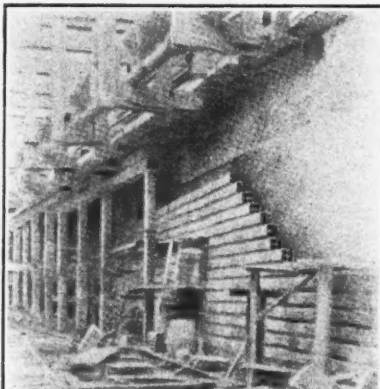
Various combinations of single and multiple ducts are made for all requirements as shown in the illustration. The standard length for multiple conduits is three feet, and short lengths furnished for fitting into man-holes are six to eighteen inches. Single duct has a standard length of eighteen inches with short sections of six, nine and twelve inches. Special types of any design may be obtained—a special round-hole construction being used in the walls of the New York Subway system. The standard two-duct conduit was used by the city of St. Petersburg, Russia, in the complete underground installation of wires.

MOTOR-GENERATOR SETS. For Transforming Current Received from Central Stations for Lighting, Power and Transportation Lines.

Because of the wide application of electrical power and the variation in the characteristics of the sources of supply transforming devices for various services are often needed. Sub-



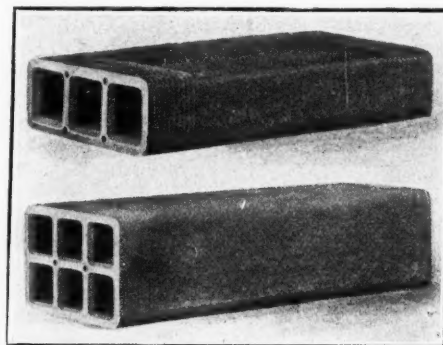
SINGLE-DUCT CONDUIT.

SPECIAL DUCT IN NEW YORK
SUBWAY.

stations fed from central power stations such as those in small lighting plants, pumping stations and street railroad substations often use motor-generator sets for transforming alternating to direct current or to alternating current of a different voltage and frequency. The Ridgway Dynamo and Engine Co., Ridgway, Pa., build motor-

generator sets of various types and capacities. One set made consists of two 70 K.W., 125-volt d.c. generators, driven by a 210 H.P. 60-cycle, 3-phase, 2300-volt induction motor and receives current from a central power plant and the generators furnish current on a three-wire system for light and power.

Of the two types shown here in the illustrations, one is a set for a substation where power factor does not enter into consideration and where, because of unskilled attendance, simplicity is essential. This particular set consists of a 250 K.W., 275-volt, d.c. generator driven by a 400 H.P., 3-phase, 60-cycle, 2300-volt, squirrel-cage type induction motor and because of the large overload capacity claimed for the Ridgway d.c. generator it requires minimum attention. The other set shown, used by street railroads, consists of a 125 K.W., 0 to 180-volt

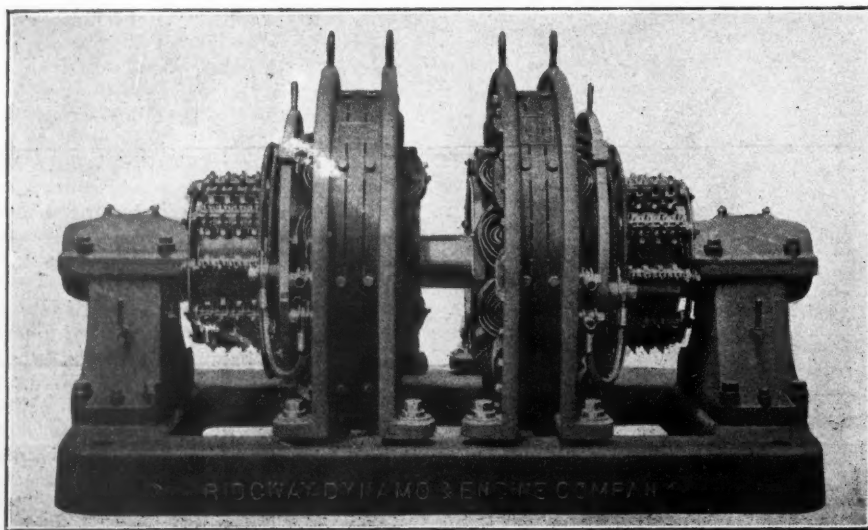


THREE AND SIX-WAY DUCT.

series generator driven by a 200 H.P., 275-volt d.c. motor. The generator has a standard armature and the field is connected in series with the armature and with a feeder, the voltage of which is to be raised. As the generator field is dependent on the current flowing in the feeder, the voltage at the generator terminals is proportional to that current and the voltage at the of the feeder is raised sufficiently to make up for the drop, due to resistance in the trolley wire.

"BEAVER" SQUARE-END PIPE CUTTER.

The Borden Co., Warren, O., is now making a four-inch pipe cutter in addition to their "Beaver" cutters of smaller sizes. The construction is the same as in the smaller sizes. The frame is divided into two principal parts—the chuck or gripping part and the cutting section, which carries the knives and is revolved by a ratchet. The tool, which is illustrated on the next page, is a solid unit of cast steel and bronze-bushed. The feed is automatic, the knives being a combined guide and cutting edge in a simple form. The cutter is so constructed that overhanging each guiding jaw is a knife which is backed up with a heavy coil spring. Centering the cutter on the pipe puts the knives in position and compresses the springs. It is claimed that with this cutter the pipe is cut square, without a burr, so that no reaming is required, and that the pipe will not be crushed or split.



MOTOR-GENERATOR SET FOR STREET RAILROAD.

EXHIBITORS AT THE CONVENTION OF THE NEW ENGLAND WATER WORKS ASSOCIATION,

Boston, Mass., Sept. 9, 10, 11, 1914.

American Bitumastic Enamels Co.—Examples of application of Bitumastic enamel; specimen of pipe coated.

James Boyd & Bro., Inc.—Boyd turbine valve seat.

A. M. Byers Co.—Byers Wrought Iron Pipe; story of its manufacture; specimens.

Chadwick-Boston Lead Co.—Lead wool specimens and examples of calking.

Chapman Valve Mfg. Co.—"Anderson" patent brass couplings; corporation cocks; gate valves; brass check valves.

Joseph Dixon Crucible Co.—Dixon's Silica-Graphite Paint; painting of standpipes and tanks.

Eddy Valve Co.—Eddy hydrant.

Electro-Bleaching Gas Co.—A bleaching plant in actual operation.

Fairbanks Co.—Fairbanks brass globe and angle valves, gate valves, check valves and iron cocks.

Ford Meter Box Co.—Section of meter box in position; meter accessories.

Goulds Mfg. Co.—Goulds pumps of various types.

Hays Mfg. Co.—Payne's patent and "New Eclipse" tapping machines; sill-cocks; valves; hose boxes; hydrants; street washers; extension service boxes.

Hersey Mfg. Co.—Compound torrent meter of a new type.

Leadite Co.—"Leadite" gasoline furnace for melting; specimens of pipe jointed with "leadite" under pressure.

Lead Lined Iron Pipe Co.—Sections of amalgamated lead lined and tin-lined iron pipe.

Ludlow Valve Mfg. Co.—Ludlow gate valves.

Macbee Cement Lined Pipe Co.—Cement lined pipe.

H. Mueller Mfg. Co.—Tapping machines; meter tester; pressure regulator; extension service box; corporation cocks; check valves.

Multiplex Mfg. Co.—Crispin air valves; sections.

National Meter Co.—"Crown," "Empire," "Nash," "Gem" and "Premier" meters.

National Tube Co.—"National" steel pipe; literature.

National Water Main Cleaning Co.—Pipe sections showing incrustations of iron, clay, lead, dirt and calcium carbonate removed from water pipes in many cities.

Neptune Meter Co.—Meters and sections; Trident meters of all types and designs.

Pitometer Co.—New "Cole" recorder for low velocities; "Cole" Pitometer Systems.

Pittsburg Meter Co.—Gauges for loss of head and wash water; operating table; model of rapid sand filter.

Rensselaer Valve Co.—Water valves and fire hydrants.

Ross Valve Mfg. Co.—Ross pressure regulating valve; fire hydrant valves.

S. E. T. Valve & Hydrant Co.—Valves, curb box and gate box.

A. C. Smith Mfg. Co.—Meter testing machine; tapping machines; sleeves and valves.

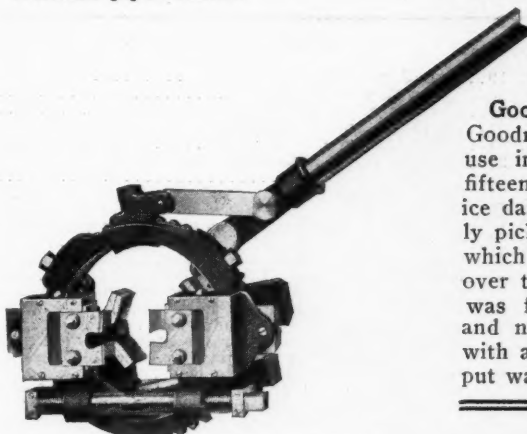
Thomson Meter Co.—Meter with glass part in operation.

Union Water Meter Co.—"Nilo," "King," "Union" water meters; vertical meters; corporations.

Van Nuhuys' Machine Works.—"Cascade" double diaphragm trench pumper (contractors' outfits).

Ware Coupling and Nipple Co.—Grip pipe fittings; couplings, connections and nipples.

Water Works Equipment Co.—Wireless pipe locator.



"BEAVER" PIPE CUTTER.

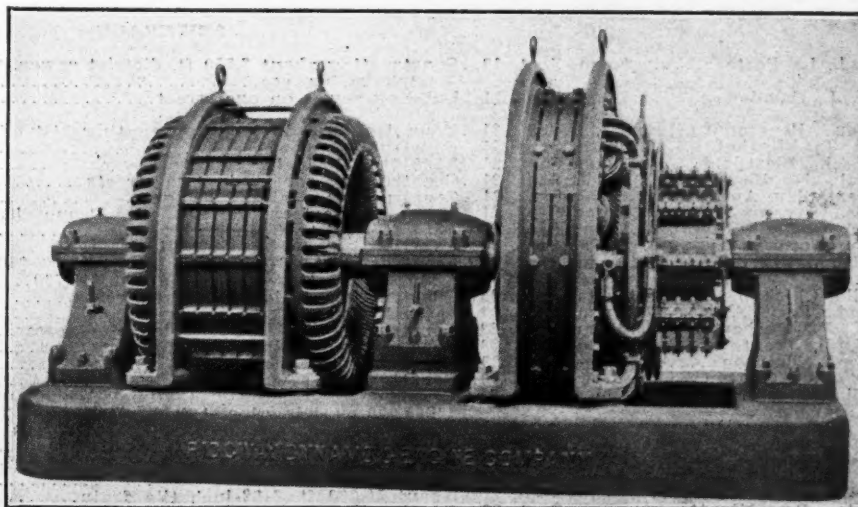
R. D. Wood & Co.—Mathews' Patent fire hydrants and indication posts and gate valves.

Standard Cast Iron Pipe & Foundry Co. (Wm. P. Woodburn, New England representative).—Cast iron bell and spigot pipe and flange pipe; castings.

Henry R. Worthington.—Disc and turbine type meters; frost-proof meters.

INDUSTRIAL NEWS

Cast Iron Pipe.—New York.—Good volume of business from private buyers, but public lettings few and unimportant. Quotations—Carload lots of 6-in., \$20.50 to \$21 per ton, Birmingham.



SQUIRREL-CAGE INDUCTION MOTOR AND GENERATOR.

ham. Manufacture of large size water pipe is on a considerable scale, but demand for smaller sizes comparatively light. Quotations—4-in., \$20.50; 6-in. and up, \$18.50.

Lead.—New York.—3.87½c. St. Louis, 3.72½c.

The Pacific Flush-Tank Company, The Temple, Chicago, and Singer Building, New York, announce that owing to the European war, Dr. Karl Imhoff will probably not be able to come to this country in September as planned. Communications addressed to him care of this firm will be forwarded to Essen. As soon as the trouble in Europe is over Dr. Imhoff will come here for a month, probably, and give his personal attention to cities and engineers.

Goodrich Fire Hose, made by the Goodrich Co., Akron, O., has been in use in a large middle west city for fifteen years and is giving good service daily. The fire department recently picked out some Goodrich fire hose which it bought in 1899, and turned it over to the street cleaners. The hose was found to be in good condition and now is putting water on streets with as much efficiency as it formerly put water on fires.

PERSONALS

E. R. Candor, superintendent of the electric light and water plant at Searcy, Ark., has been appointed city engineer.

Saville, Charles, of the firm of Hering & Gregory, consulting engineers, of New York City, has resigned to take a graduate course at the School for Health Officers of Harvard University and the Massachusetts Institute of Technology.

Elliott, L. A., has succeeded Mr. Ernest Carter as manager and superintendent of the municipal electric plant at Martin, Tenn.

Elston, Henry L., has been appointed superintendent of the municipal electric plant at Muscoda, Wis., as successor to Mr. J. M. Kaiser.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
O.	Marble Cliff	Noon, Sept. 19.	Macadamizing	C. Newhouse, Village Clerk
O.	Marysville	1 p.m., Sept. 19.	5.36 miles gravel road	C. A. Morleck, Co. Aud.
N. J.	Haledon	8 p.m., Sept. 21.	Constructing curb and gutter	J. E. Stewart, Boro. Clk.
Minn.	Alexandria	7.30 p.m., Sept. 21.	Building and improving state road, two sections	C. J. Sundblad, City Clk.
O.	Cleveland Heights	Noon, Sept. 21.	Sidewalk on one street	H. Canfield, Vil. Clk.
Tex.	Houston	10 a.m., Sept. 21.	Paving road, also supplying shell and gravel for county road work	H. L. Washburn, Co. Aud.
Ind.	Ft. Wayne	Sept. 21.	Constructing Meyer road	Co. Comrs.
O.	Painesville	Noon, Sept. 21.	Brick road	County Commissioners
Mass.	Springfield	2 p.m., Sept. 21.	Repairing, paving and resurfacing about 5,880 sq. yds.	Commanding Officer.
O.	New Lexington	Sept. 21.	Grading, paving with brick	T. B. Skinner, Vil. Clk.
Minn.	Alexandria	7.30 p.m., Sept. 21.	Constructing state road	C. J. Sundblad, City Clk.
N. J.	N. Brunswick	2.30 p.m., Sept. 21.	Resurfacing with bituminous concrete	A. J. Gebhard, Dir.
N. J.	Elizabeth	8.30 p.m., Sept. 21.	Granite block paving, brick paving and curbing	W. F. Neafsey, St. Comr.
N. J.	Westfield	8 p.m., Sept. 21.	1,000 ft. concrete sidewalk	C. Clark, Twn Clk.
Ind.	Ft. Wayne	Sept. 21.	Constructing Meyer road	Co. Comrs.
N. J.	Camden	8 p.m., Sept. 21.	Furnishing 500 more or less tons of broken stone	J. C. Haines, Chr. Com. Sts.
Pa.	Harrison	Sept. 21.	Grading, curbing and paving, one 30-ft. street	J. A. Seel, Twn. Clk.
Wis.	Madison	Sept. 21.	Improving three streets	O. S. Norsman, City Clk.
Ill.	Chicago	11 a.m., Sept. 22.	Six-foot cement sidewalks on number of streets	Board Local Imp.
Conn.	Hartford	2 p.m., Sept. 22.	Constructing in West Hartford about 5,222 ft. Amiesite, bituminous concrete or bituminous macadam pavement	C. J. Bennett, State Hwy. Com.
O.	Port Clinton	Sept. 23.	Paving two streets	W. H. Williamson, Vil. Clk.
N. Y.	Buffalo	11 a.m., Sept. 23.	Paving five streets and repaving one	F. G. Ward, Comr. P. S.
O.	Cincinnati	Noon, Sept. 23.	Widening roadway 10 ft. and other repairs	P. Fosdick, Dir. P. S.
O.	Mt. Gilead	Noon, Sept. 23.	Grading, curbing and paving two streets	T. E. Buck, Vil. Engr.
Cal.	Sacramento	2 p.m., Sept. 24.	About 31 miles of grading, and 13 miles of Portland cement concrete road	A. B. Fletcher, Hwy. Engr.
Ala.	Centerville	Sept. 24.	Grad., drain. & surfacing with chert, about 11 miles	County Commissioners
O.	Martins Ferry	Noon, Sept. 24.	Paving three streets with vitrified brick	B. Brown, Dir. Pub. Ser.
N. J.	Trenton	2.30 p.m., Sept. 25.	Constructing sidewalks and drives at Municipal Infirmary	F. Thompson, City Clk.
N. J.	Union	8 p.m., Sept. 25.	Concrete sidewalk, about 3,000 ft.	W. W. Friberger, Twp. Clk.
O.	Cincinnati	Noon, Sept. 25.	Improving one road	County Commissioners
Pa.	Philadelphia	Noon, Sept. 25.	Supplying bituminous material for bureau of highways	H. Loeb, Director.
O.	Cleveland	10 a.m., Sept. 25.	Improving one road	E. F. Krause, Clk. Co. Comrs.
O.	Columbus	Noon, Sept. 25.	Constructing about 5 miles road	J. Scott, Clk. Co. Comrs.
O.	Norwalk	10.30 a.m., Sept. 29.	Improving one road	Co. Comrs.
O.	Plqua	10 a.m., Sept. 29.	Crested wood block floor on bridge	M. T. Staley, Co. Aud.
O.	Columbus	Noon, Sept. 29.	Use of asphalt plant for period ending June 1, 1915	S. A. Kinnear, Dir. Pub. Serv.
O.	Troy	10 a.m., Sept. 29.	Crested wood block floor on bridge	M. T. Staley, Co. Aud.
W. Va.	N. Cumberland	About Oct. 1.	Two miles brick road with stone or cement curb; cost, about \$22,000	A. S. Cooper, Clk.
Ill.	Danville	About Oct. 1.	43,000 sq. yds. brick paving, reinforced concrete tunnel, 1,300 ft. long, cost about \$160,000; also second job of 14,000 sq. yds. brick paving	W. Martin, City Engr.
Ill.	Oakland	About Oct. 1.	15,000 sq. yds. brick paving and 15,000 ft. concrete curb and gutter	C. L. James, Engr., Mattoon.
Kan.	Coffeyville	Noon, Oct. 1.	Road improvements in Montgomery County	G. A. Otwell, Co. Clk.
Pa.	Harrisburg	Oct. 6.	Constructing 1,050 ft. brick block pavement in Forest County, and about three-quarter mile brick block pavement in Erie County	State Highway Dept.
Pa.	Harrisburg	10 a.m., Oct. 6.	Reconstructing 8,891 ft. brick pavement	E. M. Bigelow, State H. Comr.
O.	Cincinnati	Noon, Oct. 9.	Repairing pipe	F. E. Wesselmann, Pres. Bd. Co. Comrs.
SEWERAGE				
Ind.	La Porte	9 a.m., Sept. 19.	Constructing about 3,750 ft. district sewer, together with catch basins, etc.	W. F. Krueger, City Clk.
N. J.	Camden	8 p.m., Sept. 21.	Building sewer on one street	J. C. Haines, Chr. Com. Sts. & Hwys.
Tex.	Beaumont	Sept. 21.	Four drainage ditches, aggregating 21.4 miles	Drainage Comrs.
N. J.	Elizabeth	8.30 p.m., Sept. 21.	Constructing sewers	W. F. Neafsey, St. Comr.
N. J.	Westfield	8 p.m., Sept. 21.	3,500 ft. 8-10-inch sanitary sewer	City Clk.
Cal.	San Bernardino	Sept. 21.	Constructing sewers in two streets	City Council.
Tex.	San Antonio	Sept. 21.	Constructing sanitary sewers	City Clerk.
Ga.	Savannah	Noon, Sept. 21.	Storm and sanitary sewers. (See Proposal ad.)	E. R. Conant, Ch. Engr.
La.	Council Bluffs	8 p.m., Sept. 21.	1,557 ft. of 6 to 45-inch sewer	C. J. Duff, City Clk.
La.	Forest City	Sept. 22.	Constructing ditches and tile laterals	C. P. Nelson, Co. Aud.
Minn.	Slayton	10 a.m., Sept. 22.	94,275 ft. 6 to 26-inch tile ditch to cost \$30,184. Digging and laying tiling to cost about \$19,730	W. A. Seeman, Co. Aud.
Ill.	Chicago	11 a.m., Sept. 22.	Constructing drains in eight streets	Board Local Imp.
Ind.	Peru	7.30 p.m., Sept. 22.	Lateral sewer in two streets	P. L. Bell, Jr., City Clk.
N. Y.	Rochester	2 p.m., Sept. 22.	Constructing 1,064 ft. vitrified pipe sewer	M. J. Magin, Clk.
N. J.	Trenton	2.30 p.m., Sept. 23.	Constructing drains in two streets	F. Thompson, City Clk.
N. J.	Trenton	2.30 p.m., Sept. 23.	Sewer in one street	F. Thompson, City Clk.
O.	Port Clinton	Sept. 23.	Constructing sewers	W. H. Williamson.
Ill.	Chicago	Noon, Sept. 24.	Constructing section 1, Calumet-Sag channel, requiring 265,000 cu. yds. glacial drift excavation, 315,000 cu. yds. solid rock excavation and 19,050 cu. yds. concrete	J. T. McGillan, Clk. Sant. Dist.
O.	Cincinnati	Noon, Sept. 24.	Sewer in three streets	P. Fosdick, Dir. Pub. Service.
La.	Creston	8 p.m., Sept. 30.	About 37,000 ft. sanitary sewer from 6 to 12-inch, 44 man-holes, and 26 lamp holes	T. S. DeLay, City Engr.
La.	Algona	2 p.m., Sept. 30.	About 50,000 ft. 6-32-inch tile drain	D. E. Norton, Co. Aud.
Ala.	Bav Minette	Sept. 30.	Constructing water works, sewers & electric light plant	W. D. Stapleton, Mayor
Ky.	Louisville	About Oct. 1.	Constructing 1,000 ft. 24 and 28-in. pipe sewer and 1,500 ft. 30 to 39-in. concrete sewer	R. W. Burke, Asst. C. E.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
La.,	New Orleans	Noon, Oct.	2..Making extensions to drainage station.....	F. S. Shields, Sec. Sew. & Water Board.
Ia.,	Knoxville	1.30 p.m., Oct.	5..Constructing one ditch	J. D. Schlotterback, Co. Aud.
Ia.,	Knoxville	1.30 p.m., Oct.	15..Constructing ditch, length about 6 miles.....	W. O. Price, Constr. Engr.
La.,	New Orleans	Noon, Nov.	14..Sewer extensions, water extensions, connections to sewers and water mains, etc.....	F. S. Shields, Sec. Sew. & Water Board.

WATER SUPPLY.

Minn.,	Columbia Hgts.	8 p.m., Sept.	19..Extending water works	C. R. Holstrom, Rec. Greater Winnipeg Water Dist. Quartermaster.
Man.,	Winnipeg	Sept.	19..84 miles of aqueduct, \$8,729,000.....	A. M. Taxton, City Clk.
Ark.,	Ft. Logan H. Roots	Sept.	20..Cleaning water mains.....	Board Public Works.
Miss.,	Vicksburg	5 p.m., Sept.	21..Water works system and filters.....	Maj. C. A. Bassett.
Wis.,	Milwaukee	10.30 a.m., Sept.	21..Coal hoppers, automatic weighing scales, tracks, etc., for pumping station	State Bd. Administration.
Ill.,	Normal	3 p.m., Sept.	21..One electrically-driven deep well pump, steel tower, 40,000 gallons, c-i. water pipe, etc.....	J. J. Molter, Dir. P. S.
Ill.,	Springfield	3 p.m., Sept.	21..Electrically driven well pump, steel water tower, c-i. pipe, generator sets, etc.....	Comr. Pur. & Supplies.
O.,	Sandusky	Sept.	22..Constructing 42-inch intake.....	Board Water Comrs.
O.,	Cleveland	Sept.	23..Three vertical triple expansion crank and flywheel pumping engines.....	W. H. Fuller, Asst. City Engr.
N. J.,	East Orange	8 p.m., Sept.	25..Cast-iron pipe and specials.....	Board Village Trustees.
Neb.,	Hastings	Sept.	28..1,630 ft. main, 4-inch; 1 hydrant, and 2 water gates; cost about \$1,500	X. A. Kramer, Engr., Magnolia
Neb.,	Bridgeport	Sept.	28..Furnishing and delivering 8,000 ft. 4-in. Class D bell and spigot c-i. water pipe, 4,500 lbs. special castings, 10 4-in. gate valves, 12 fire hydrants, 4-in. hub, etc.....	E. E. Mathes, Twn. Clk.
Miss.,	McComb	Sept.	29..Concrete reservoir	T. S. DeLay, Consulting Engr., Creston.
N. J.,	Belleville	9 p.m., Sept.	29..Laying c-i. water pipe, 6 to 12-inch, on about nine streets, and resetting valve boxes, etc.....	B. Hennessey, Sec. Bd. Agr., Oklahoma City.
Ia.,	Stanton	8 p.m., Oct.	1..Water works system, 3,617 ft. 6-in., 6,113 ft. 4-in. pipe, 6,500 specials, 19 hydrants, steel tank and tower, pump, engine or motor	W. J. Sherman, Co. Engr., Toledo.
Okla.,	Goodwell	2 p.m., Oct.	1..Extending water system, including 6,000 gallon steel tank on 30-foot tower	C. Latshaw, City Engr.
O.,	Brewsters	About Oct.	1..Water works system; cost \$10,000.....	Bureau Sup. & Accts., Navy Dept., Wash., D. C.
O.,	Fostoria	About Oct.	1..140 million gallon capacity rip-rap or concrete reservoir	
H. I.,	Pearl Harbor	10 a.m., Oct.	6..Furnishing water meter	

LIGHTING AND POWER.

N. J.,	Passaic	Sept.	21..Lighting streets for five years.....	Z. A. Van Houten, City Clk.
N. Y.,	Brooklyn	Sept.	22..225,000 ft. flexible cable and other electrical supplies.....	Bureau Sup. & Accts., Navy Dept., Wash., D. C.
D. C.,	Washington	Sept.	22..Over 300,000 ft. of various kinds of wire, insulating conductor, etc.; 200 iron boiler tubes; 2 bucket turbine cutting machines, etc.....	Bureau Sup. & Accts., Navy Dept.
Minn.,	Moorehead	Sept.	22..Electrical, heating, ventilating and plumbing work in school	C. H. Johnson, Archt., St. Paul.
Fla.,	Key West	11 a.m., Sept.	26..Furnishing and erecting 200 h-p. water tube boiler.....	Bureau Yds. & Docks, Navy Dept., Wash., D. C.
N. Y.,	Ithaca	2 p.m., Sept.	28..Electric work, heating and plumbing, also construction drill hall	E. L. Williams, Cornell Univ.
S. D.,	Alexandria	Oct.	5..Furnishing and installing complete municipal electric light system	H. M. Shoemaker, City Aud.
R. I.,	Narragansett Pier	Oct.	7..Lighting fixtures, and construction complete of post office	O. Wenderoth, Supt. Arch., Washington, D. C.
Australia,	Melbourne	Oct.	14..Furnishing and delivering low tension cables and instruments, also fuses, etc.....	P. McBride, Agent, Gen., Victoria Melbourne Place, London, E. C.

FIRE EQUIPMENT.

O.,	Marion	Noon, Sept.	22..Furnishing one triple combination motor fire engine in exchange for combination motor chemical and hose.....	E. T. Smart, Dir. Pub. Wks.
N. J.,	Passaic	Sept.	24..Constructing fire stations, to cost about \$3,000.....	City Clerk.

BRIDGES.

O.,	Cleveland	10 a.m., Sept.	19..Two concrete culverts and one arch.....	Board Co. Comrs.
Mass.,	Sunderland	6 p.m., Sept.	19..Constructing two concrete abutments for bridge.....	F. L. Hubbard, Chr. Bd. Selectmen.
Kan.,	Wichita	Sept.	20..Reinforced concrete substructure, 3 bridges & 2 culverts.....	E. W. Moore, County Engr.
Minn.,	Buffalo	2 p.m., Sept.	21..Bridge over one river.....	J. A. Berg, Aud.
Ind.,	Indianapolis	Sept.	22..One reinforced concrete bridge.....	C. MacGuire, Comr.
Tex.,	Dallas	Sept.	22..Constructing 75-in. concrete culvert.....	City Clerk.
Pa.,	Harrisburg	11 a.m., Sept.	23..Two concrete bridges.....	H. W. Dough, Co. Cont.
Kan.,	Concordia	Noon, Sept.	24..Six reinforced concrete bridges.....	State Engr., Manhattan
O.,	Cincinnati	Noon, Sept.	25..Concrete	A. Reinhardt, Clk. Comrs.
O.,	Canton	10 a.m., Sept.	25..1 concrete bridge.....	County Comrs.
Pa.,	Allentown	9 a.m., Sept.	28..Constructing number of bridges	Co. Comrs.
N. Y.,	Rochester	Oct.	1..Constructing bridge at Charlotte.....	Co. Comrs.
Kan.,	Coffeyville	Noon, Oct.	1..Constructing six bridges in Montgomery County.....	G. A. Atwell, Co. Clk.
Ont.,	Toronto	Noon, Oct.	5..Bridge over Bloor Street.....	H. C. Hocken, Mayor.
Pa.,	New Castle	2 p.m., Sept.	8..645-foot bridge, with concrete arches on either side.....	J. R. Lamoree, Clk. Co. Comrs.
Tenn.,	Chattanooga	10 a.m., Oct.	22..Constructing one bridge.....	Tennessee River Bridge. Com.

MISCELLANEOUS.

N. Y.,	Fire Island	11 a.m., Sept.	19..One-story terra cotta and concrete building.....	H. R. Stanford, Ch. Bur. Docks, Navy Dept., Wash., D. C.
Wash.,	Tacoma	Sept.	19..Supplying steel rails, crossings, switches, etc.....	City Engineer.
Cal.,	Mare Island	11 a.m., Sept.	19..Reconstructing quay wall.....	H. R. Stanford, Chr. Navy Dept., Washington, D. C.
N. Y.,	New York	3 p.m., Sept.	21..Heating and ventilating apparatus, for several schools.....	C. B. J. Schneider, Supt. School Bldgs.
Mich.,	Detroit	10 a.m., Sept.	21..Machinery and equipment for garbage disposal plant.....	Dept. Public Works.
N. J.,	Camden	8 p.m., Sept.	21..Furnishing city about 500 sq. yds. broken stone.....	J. C. Haines, Chr. Sts.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Miss.	Meridan	Sept. 22	Constructing \$100,000 city hall	City Clerk.
O.	Cleveland	Sept. 22	Air washers, humidifiers, tempering coils, etc.	Supv. Architect, Wash., D. C.
Ill.	Chicago	11 a.m., Sept. 22	350 tons reinforcing steel	L. E. McGann, Comr. Pub. Ser.
Ill.	Chicago	11 a.m., Sept. 22	Six 96-inch sluice gates	L. E. McGann, Comr. P. S.
O.	Mansfield	Noon, Sept. 23	Combination patrol and ambulance, motor driven; also police and signal system	C. H. Hughes, Dir. P. S.
D. C.	Washington	3 p.m., Sept. 24	Postoffice building at Mandan, N. D.	O. Wenderoth, Supv. Arch.
N. J.	Trenton	2.30 p.m., Sept. 25	Filling in lands along river and disposal plant	F. Thompson, City Clk.
S. C.	Charleston	11 a.m., Sept. 26	Three 15-ton locomotive cranes	H. R. Stanford, Ch. Bur. Yds. & Docks, Navy Dept., Washington, D. C.
Tex.	Amarillo	3 p.m., Sept. 28	Constructing complete 3-story post office and Court House	O. Wenderoth, Sup. Arch., Treas. Dept., Wash., D. C.
Cal.	San Francisco	Sept. 30	Constructing Twin Peaks tunnel (date extended)	City Engineer
D. C.	Washington	3 p.m., Sept. 30	Supplying metal vault equipment for stamp vault	O. E. Wenderoth, Supv. Arch., Washington, D. C.
D. C.	Washington	11 a.m., Oct. 3	Shipbuilding cranes at Boston and Philadelphia	H. R. Stanford, Bur. Yds. & Docks, Navy Dept.
Pa.	Pittsburgh	Noon, Oct. 3	Steel lock gates, valves and lock operating machinery	Lieut.-Col. F. R. Shunk, Boro. Engr., U. S. A.
N. Y.	New York	Oct. 6	Constructing section of Lexington Avenue subway	Public Service Commission.
D. C.	Washington	2 p.m., Oct. 15	Collection and disposal of garbage, etc.; optional period	District Comrs.
Pa.	Philadelphia	Oct. 16	Garbage disposal	Morris L. Cook, Dir. Pub. Wks.

STREETS AND ROADS

Gadsden, Ala.—Ordinance providing for curb and gutter for Walnut St., cost of which will be about \$7,000, has been passed by Council, and Sept. 30 was set as date for hearing objections.

Mobile, Ala.—County Supervisors have authorized \$50,000 road bond issue for District No. 8.

Montgomery, Ala.—Contract for state aid road work in Chambers County has been awarded by W. S. Keller, State Highway Engineer. New road will be constructed at cost of \$10,570, one-half of which will be paid by state and will extend from Lafayette toward Lee County line, on what is known as Lafayette-Opelika road.

Tuskegee, Ala.—City has voted \$15,000 in bonds for improvement of streets. E. W. Thompson is Mayor.

Phoenix, Ariz.—State highway bond issue of \$5,000,000 will be voted on Nov. 3.

Hanford, Cal.—Road bonds in sum of \$675,000 will be voted on Sept. 18.

Petaluma, Cal.—East Washington St. improvement bonds in sum of \$20,000 will be voted on Sept. 29.

Porterville, Cal.—Plans which have been approved for proposed system of Tulare County highways call for three main-line highways through county from north to south in addition to state highway, which is to be built down East Side. Maps as prepared by commission show road starting at south line of county to run through Ducor, Terra Bella, Porterville, Lindsay and Exeter to Visalia; one from Oroqui district through Lemon Cove and Mud Springs to Dinuba; one from Lindsay to Tulare and state highway from Goshen south within mile of Visalia; thence through Tulare and on through Pixley to south line of county. It has been estimated that this system of roads, which totals about 112 miles, can be built for \$1,200,000, including \$200,000 which is necessary for bridge work and other incidentals in connection with state highway. Funds for work will be raised by bond issue.

Sacramento, Cal.—Resolution ordering improvement of U St. from 8th to 19th has been adopted by City Commission.

Sacramento, Cal.—Calling of bond election for \$2,425,000 for construction of roads in Sacramento County will come before Board of Supervisors.

Santa Ana, Cal.—State Highway Commission at Sacramento has received bids for construction of state highway between Santa Ana and Irvine, and it is understood that contract will be let upon those bids. Distance to be covered by this section of road is 7.4 miles, and the engineer's estimate of what cost of road would be was \$47,990.62. Lowest bid received was \$37,935.50, from White & Gaskill, of Long Beach, so that there is little probability that Commission will fall to let contract. It is estimated that cost of material to be furnished by State to contractor will be \$17,374.50. Within ten days contract will be signed for construction of 9.4 miles of state road between Irvine and Galivan. Bids for that section were opened on Aug. 10, lowest bidder being B. R. Davisson Contracting Co., of Monrovia.

Santa Barbara, Cal.—A county bond issue of a million dollars is planned to be voted in near future for construction of comprehensive road system, county hospital and detention home.

Wilmington, Del.—In committee of the whole, City Council has decided to request Street and Sewer Department to have commission appointed to open New St. to Girard St.

Bartow, Fla.—Street paving bonds in sum of \$75,000 will be voted on Oct. 6.

Jacksonville, Fla.—Repaving of portion of Riverside Ave. is being discussed.

Miami, Fla.—Plans and specifications are being prepared by E. H. Klyce, engineer, 52 Real Estate Building, to pave Ave. D from bridge south to about city limits; also data for paving Biscayne Drive.

Ocala, Fla.—See "Miscellaneous."

Macon, Ga.—Ordinance has been passed for paving of Walnut and 7th Sts. D. S. Jones is Clerk of Council.

Morgan, Ga.—Calhoun County will vote Sept. 26 on \$100,000 bonds for construction of roads and bridges. Z. T. Rabun is chairman board.

Pocatello, Ida.—Plans and specifications have been made for street and sidewalk paving to cost about \$300,000.

Blomington, Ill.—East Washington St., from Main to Robinson Sts., will be paved this year as originally planned.

Canton, Ill.—Work of surveying 4½ miles of Fulton Co. highways designated for first improvement with State aid has been finished.

Canton, Ill.—Ordinance has been approved providing for improvement of W. Vine St. from the west line of N. Main St. to the west line of N. Avenue C by grading, curbing with concrete curbing and paving with concrete paving to width of 26 ft., between the roadway faces of the curbing, except at street and alley intersections, where said street shall be paved to the full width of the street; to be known and designated as paving district No. 43. O. W. Brickner is City Engineer.

Chicago, Ill.—The campaign plan for concerted advertising movement by citizens to effect a \$2,000,000 bond issue for better roads in Cook County is being discussed.

Peoria, Ill.—A proposed change in specifications for purpose of improving on plans for State aid highway on Knoxville Rd. has been approved by P. C. McArdle, acting chief state highway engineer, and if no legal obstacles are encountered, bituminous binder will be used in the construction.

Springfield, Ill.—Resolution has been passed for paving Adams St. from 2d to 5th Sts. with creosote blocks.

Evansville, Ind.—The County Council of Vanderburg County has made appropriation for \$2,500 asked by County Commissioners preparatory to working prisoners in county jail upon city streets and county highways.

Fort Wayne, Ind.—Board of Works will have to readvertise and receive new bids for paving of Webster St., from Killea St. to Wildwood Ave., as resident property owners want their thoroughfare paved with anchored bituminous concrete instead of asphalt, as award originally was made.

Lafayette, Ind.—Seventh St., from South to Kossuth St., will probably be paved with brick.

South Bend, Ind.—Following hearing assessment roll on resurfacing of S. Lafayette St. from Sample St. to 281½ ft. north of Tutt St. was confirmed by Board. The assessment covers 29,863 sq. yds. of resurfacing at approximately \$1.42 a square yard.

Washington, Ind.—Election at which voters of Washington Twp. will decide whether they desire main roads of township to be permanently improved at cost of approximately \$300,000, will be held Oct. 10, instead of Oct. 6.

Council Bluffs, Ia.—Resolution ordering advertising for bids on about six miles of new concrete sidewalk has been adopted.

Clinton, Ia.—City Council has ordered Clerk to advertise for bids for 3d St. paving from 4th to 8th Aves.

Dubuque, Ia.—City Council will improve Villa St. from Cleveland Ave. to Rush St. J. J. Shea is City Recorder.

Oskaloosa, Ia.—Construction of sidewalks in Penn College addition is planned.

Pittsburg, Kan.—Resolution has been adopted ordering curbing and guttering of Ninth St. from Broadway to Walnut St., with combined concrete curb and gutter. Leonard Boyd is City Clerk.

Pittsburg, Kan.—Resolution has been adopted for construction of large number of sidewalks. Leonard Boyd is City Clerk.

Louisville, Ky.—Ordinances have been adopted for improvement of various streets.

Maysville, Ky.—Road bond issue in sum of \$200,000 will be voted on Nov. 3.

New Albany, Ky.—Estimate of cost to property owners on each side of Whitehill St. for cost of proposed improvement of that street is placed at \$4.46½ a foot, and cost of improvement of Galt St. to property owners on each side is placed at \$3.35. Estimates of cost of improvement of two streets have been submitted to New Albany Board of Public Works by Samuel T. Mann, City Engineer. City Engineer has also submitted estimate on cost of improvement on E. 10th St. from Main to Market. Estimated cost of improvement with macadam is \$3.30 a foot, and vitrified brick, \$4.65. City Engineer has been directed to prepare plans and specifications for improvement of Oak St. from E. 5th to E. 7th.

Annapolis, Md.—Plans for opening of public road leading from Annapolis-Baltimore Blvd. to Winchester Station, in 3d district, have been approved by Board of County Commissioners.

Baltimore, Md.—Bids received for road work at Loch Raven have been rejected as too high, and will be re-advertised.

Becket, Mass.—About 8,000 ft. of road from Bonnyrigg Corners north will be improved with special appropriation made by legislature.

Boston, Mass.—Board of Street Commissioners is planning extension, improvement and construction of various streets.

New Bedford, Mass.—Board of Aldermen has adopted order directing that Hicks St. be macadamized.

New Bedford, Mass.—Figures from five bidders on street surfacing for New Bedford's highways have been opened by Charles F. Lawton, Superintendent of Streets. Specifications called for bids on seven different kinds of street surfacing, with additional item, completion of Hassam paving work which has already been started. Bids for various contractors were as follows: Franklin Contracting Co., of New York—concrete base, \$4.50 per cu. yd.; wood block (A), \$2.28 sq. yd. Warren Brothers Co., of Boston—concrete base, \$5 cu. yd.; wood block (B), \$3.30 sq. yd.; endurite, \$1.50

sq. yd. Simpson Brothers Corp., of Boston—concrete base, \$4.90 cu. yd.; granite block, \$2.60 sq. yd.; wood block (A), \$3.05, (B) \$3.50 sq. yd.; brick, \$2.10 sq. yd.; asphalt, \$1.65 sq. yd.; Hassam block, \$1.95 sq. yd.; endurite, \$1.55 sq. yd.; to complete Hassam already started, \$2,641.51. Adams, Ruxton Construction Co., of Springfield—concrete base, \$5.00 cu. yd.; wood block (B), \$3.15 sq. yd.; endurite, \$1.53 sq. yd. John B. Sullivan & Son, of New Bedford—concrete base, \$5.50 cu. yd.; granite block, \$1.85 sq. yd.; wood block (A), \$2.20 sq. yd.; brick (Mack brick), \$1.70 sq. yd.

Salisbury, Mass.—Town will expend \$11,000 for improvement of roads at beach end.

Springfield, Mass.—Board of Supervisors has decided to pave Walnut St., at cost of about \$6,000.

Springfield, Mass.—Board of Aldermen are discussing question of building sidewalks and curbing on Abbe Ave. near Brightwood school.

Caumet, Mich.—Board has decided to make extensive improvements on most traversed highways in township.

Saginaw, Mich.—In preliminary survey of river route, known as boulevard, now being conducted along east side of Saginaw River by party of surveyors under direction of State Highway Commissioner, the Bay Co. road commissioners have expressed preference for Tuscola road, passing through Indiantown on east side of river, and into Saginaw on N. Washington Ave.

Saginaw, Mich.—State highway commissioner has party of surveyors making preliminary survey of river route, locally called the boulevard, along east side of Saginaw river. Upon completion route survey and estimates of cost of building on each of three routes made by state highway commission, and practicability and desirability of each route considered, county authorities of Bay and Saginaw will probably designate and fix trunk line route between two cities. Distance on river route from Sixth street bridge in Saginaw to south end of Broadway in Bay City is eight miles, without single railroad or highway crossing to obstruct travel. State pays \$3,400 a mile on all 16 foot stone or concrete trunk lines, and builds all bridges of 30 feet and longer.

Buhl, Minn.—Proposition of issuing bonds in sum of \$50,000 for street paving, improvements to municipal power plants, etc., has been carried.

Duluth, Minn.—Board has authorized issuance of bonds in sum of \$150,000 for State rural highway No. 4, the St. Louis Co. portion of the Duluth-St. Vincent road. It will be 32 miles long.

St. Paul, Minn.—Council has appropriated \$2,628 for paving of street intersections on Hastings Ave., between Bates Ave. and Plum St., with creosoted wood blocks. Following final orders also were passed by Council: Grading of alley in block surrounded by Forest, Cypress, Case and Jenks Sts., at cost of \$584, or 39 cts. a front foot, and grading Como-Phalen Ave., from Edgerton St. to Payne St., at cost of \$1,323, or \$1.12 a front foot.

Joplin, Mo.—Resolutions have been adopted for improvement of Virginia Ave. and Division St. by constructing class "B" concrete curb and gutter. O. E. Lichter is City Clerk.

Osceola, Mo.—Road Improvement bond issue in sum of \$14,000 will be voted on Nov. 3.

St. Joseph, Mo.—Members of Board of Public Works have rejected bids for proposed paving of highway from 7th St. and Highland Ave. to 2nd St. and Hamburg, and will again advertise for bids.

Bayonne, N. J.—Issuance of \$150,000 worth of bonds for building of permanent roadway along three miles of boulevard has been authorized by Board of Freeholders. Stretch includes from Paterson Plank Rd. to Newark Ave. and from Liberty Pl. to 7th St., on Boulevard Loop, Weehawken. Cost of roadway estimated by Frederick Dunham, Engr. of Blvd. Comm., at about \$50,000 per mile.

Elizabeth, N. J.—Following bids were received for resurfacing work: Continental Public Works Co., ranging from \$1.08 per sq. yd. to \$1.12; M. J. Leahy, a flat charge of \$1.07 per sq. yd.; Cleveland-Trinidad Paving Co., \$1.25 to \$1.60; Hassen Paving Co., a flat rate of \$1.22 per sq. yd.; Newton Paving Co., \$1.09 to \$1.17; Sicilian Asphalt Paving Co., a flat rate of \$1.23 per sq. yd.; J. F. Shanley Co., \$1.30 to \$1.35; Union Paving Co., \$1.33 to \$1.48. Following bids were received for paving of Baltic St., from First to Third Aves., with brick: Samuel Sampson, \$12,896.42; John C. O'Neill, \$12,686.55, and for the paving of Caspian St., from

First to Third Ave., with brick: Samuel Sampson, \$13,087.40; John C. O'Neill, \$13,043.30; James J. Potts, \$12,573.10.

Hackettstown, N. J.—Largely signed petitions addressed to State Road Commissioner E. H. Stevens and joint appropriations committee of legislature are being prepared here. Petitions ask for macadamizing of Hackettstown-Waterloo highway by State aid, and set forth half dozen reasons why this much-traveled road should be improved.

Long Branch, N. J.—Maps and specifications prepared by County Engineer George D. Cooper for improvement of road from Allentown to New Canton, about a mile in length, and other plans and specifications for road from Sweetman's Lane to Perineville, have been approved and clerk directed to advertise for bids to be received at next meeting of board on Oct. 14.

Newton, N. J.—Improvement of road from Newton to Sparta is being favorably considered. Estimated cost, \$12,000 per mile.

Petta Amboy, N. J.—Following bids have been received for paving New Brunswick Ave.: Liddle and Riemer, excavation, 92 cts. a cu. yd.; concrete, \$4.10 a cu. yd.; old curb, 19 cts. a lin. ft.; new curb, 30 cts. a lin. ft.; Metropolitan brick, \$1.43 a sq. yd.; Metropolitan brick, \$1.44; Auburn, \$1.34; Mack, \$1.40; Glen-gary, \$1.34. Jens W. Rour, excavation, 91 cts.; concrete, \$3.31; old curb, 42 cts.; new curb, 12 cts.; Metropolitan brick, \$1.38; Cavanaugh, \$1.39; Mack, \$1.34; Clear-heid, \$1.34. J. N. Wester, excavation, 89 cts.; concrete, \$3.38; old curb, 31 cts.; new curb, 30 cts.; Metropolitan brick, \$1.32; Auburn, \$1.33; Clearheid, \$1.14. Graman & McKee, excavation, 80 cts.; concrete, \$3.30; old curb, 28 cts.; new curb, 12 cts.; Metropolitan brick, \$1.37; Pennsylvania clay, \$1.31; Paxton, \$1.47. Martin Hanson, excavation, 90 cts.; concrete, \$3.30; old curb, 20 cts.; new curb, 65 cts.; Metropolitan brick, \$2.19; Clearheid, \$2.12; Auburn, \$2.16. East Jersey Contracting Co., excavation, 92 cts.; concrete, \$4.40; old curb, 20 cts.; new curb, 50 cts.; Metropolitan brick, \$1.90; Clearheid clay, \$1.48; Clearheid brick, \$1.46; Auburn, \$1.50; Mack, \$1.47. John E. Donovan, excavation, 45 cts.; concrete, \$4.00; old curb, 29 cts.; new curb, 70 cts.; Porter National, \$1.70; Seaboard, \$1.70. Meagher & Smith, excavation, 83 cts.; concrete, \$3.23; old curb, 5 cts.; new curb, 68 cts.; Metropolitan brick, \$1.34; Pennsylvania clay, \$1.47; Paxton, \$1.48. Banks & Halbac, excavation, 59 cts.; concrete, \$4.30; old curb, 34 cts.; new curb, 64 cts.; Paterson brick, \$1.30; Metropolitan, \$1.30; Auburn, \$1.33; Clearheid, \$1.77; Mack block, \$1.61. The firm suggested the use of a special concrete curb in place of bluestone. Contract has not yet been awarded.

Vinciano, N. J.—Improvement of three roads has been ordered—Italia Ave., West Ave. and portion of Chestnut and Mill Road.

Westland, N. J.—Ordinances to improve Ludewood Parkway and Pleasant Pl., for sidewalks in sections of Myrtle Ave. and Grove St., have been passed.

Hudson, N. Y.—Improvements to Green St. are being discussed.

Rochester, N. Y.—Ordinance has been adopted for paving of Ave. D with brick.

Rochester, N. Y.—See "Miscellaneous."

Stillwater, N. Y.—Bids will be received until Sept. 19 for purchase of \$30,000 town bonds.

Utica, N. Y.—The local office of State Highway Department, in charge of Division Engineer James H. Sturdevant, is preparing plans for 1915 road construction, bids for which will be let during October, after state appropriation of \$5,000,000 becomes available first of next month, this being second half of sum appropriated for this year, a similar amount having been made available last February. Oneida County's share of October money will be about \$148,000. It is present intention to build three county roads with this amount next year, namely: Oneida-Munnsville, Vienna-New London and Taberg-Tompkins Corners. A state road from Camden north toward Colosse is also planned and, if a sufficient sum remains, a state road from Poland toward Barneveld.

Asheville, N. C.—Improvement of Asheville-Weaverville highway is being discussed.

Kinston, N. C.—Grand Jury recommends good roads bond issue.

Wilmington, N. C.—Only one bid, that of Atlantic Bitulithic Co., was submitted to City Council for paving both sides of Market St. from 10th to 17th, with bitulithic. Company in its proposal offered to do work for \$2.19 a sq. yd. Contract has not yet been awarded.

Wilson, N. C.—Road to Lucania to connect with road to Central Highway will be constructed by county.

Beaver, O.—Bids will be received at the office of the Commissioners of Mahoning County, Ohio, until 12 o'clock noon on 17th day of October, 1914, for purchase of bonds of the said county in aggregate sum of \$10,000 for purpose of providing fund for payment of proportion of cost for construction and improvement of section of public highway known as and being intercounty highway No. 86. Frank H. Vogan is Clerk of Board of County Commissioners.

Cincinnati, O.—Improving of Lees Creek Road is estimated to cost about \$19,830.

Dayton, O.—Paving of Longworth St. is being considered.

East Youngstown, O.—A movement is on foot among several of Wilson Ave. business men to have Council prepare legislation for paving of several of hill streets, including 10th St. and Adams Ave.

Greenville, O.—County Commissioners have sold bonds for township's share of cost of construction of Greenville-Celina intercounty highway. Greenville and Richland twps. are two interested and their apportionment of cost is approximately \$25,000.

Lisbon, O.—Diag roads are being considered.

Marble Cliff, O.—Bids will be received until noon, Sept. 19, by C. Newhouse, Village Clerk, for purchase of bonds in sum of \$17,000 for improving of Cambridge Pl. Ave.

Mt. Gilead, O.—Bids will be received by T. E. Buck until noon, Sept. 23, for grading, curbing and paving of two streets.

Eugene, Ore.—Paving of 9th Ave. East is to be continued, also paving of Alder St.

Chester, Pa.—By Council \$75,000 paving bond issue to E. J. Coleman, Philadelphia, at par, with accrued interest.

Erie, Pa.—As no bids were received for repaving 11th St. from Cherry to Liberty, city engineer was directed to readvertise for bids.

Erie, Pa.—Following ordinance have been passed finally: Providing for grading, curbing, draining and paving of Wilson St., from Third to Fifth St.

Erie, Pa.—Ordinance has been passed which provides for curbing, draining and grading of 30th St. from Peach to Chestnut Sts.

Ferndale, Pa.—Ferndale's bond issue of \$7,000 for street improvements has been sold to Johnstown Savings Bank.

Hanover, Pa.—Following bids have been received for paving of Abbottstown St.: Hassam Paving Co., \$1.50 per sq. yd. for Hassamite paving on a 6-in. concrete base, guaranteed for five years; Thomas J. Wolf, 87 cts. per sq. yd. for a 6-in. concrete base, \$1.18 per sq. yd. for asphaltic concrete and brick top or wearing cause; Thomas Dwyer and Patrick McCormick, trading as Dwyer & Co., 83 cts. per sq. yd. for 6-in. concrete base; \$1.25 per sq. yd. for Warrenite top or wearing cause; vitrified brick block on a 6-in. concrete base, \$1.27 per sq. yd.

Indiana, Pa.—Paving bond issue of \$10,000 will be voted on Nov. 3.

Johnstown, Pa.—Mayor urges immediate paving of Franklin St., between 6th and 8th Wards.

Johnstown, Pa.—State aid will be asked for improving of old Hamilton Road. Borough Engineer O. P. Thomas has presented plans for improvement of road at cost of between \$23,000 and \$25,000. Brick on concrete base likely would be paving material.

Lewistown, Pa.—Ordinance has been passed for paving of 3d St. from Grand to Valley Sts.

Wilkes-Barre, Pa.—Ordinance has been passed authorizing paving of section of Kidder and Race Sts., Magnolia and Kirkendale Aves. and Foster Lane.

Williamsport, Pa.—It has been officially stated that city would pave Church St. from Mulberry St. to Laurel this fall. Survey of route of proposed paving has been made by city engineering corps.

Hopkinton, R. I.—Two hundred dollars of annual appropriation for repair of highways has been allotted each highway district.

Newport, R. I.—Extension of Washington St. boulevard is being discussed.

Pawtucket, R. I.—Joint resolution calling for appropriations of \$3,800 for improvement of Lily Pond St. from Conant St. to Pine St. has been passed by Board of Aldermen. Similar resolutions calling for appropriations of \$2,000 for improvement of Locust St. from Broadway 317 ft. westerly, and of \$4,200 for improve-

ment of Hancock St. from Weeden St. to Mineral Spring Ave. have been referred to committee on finance.

Woonsocket, R. I.—Resolution for laying out of Ninth Ave. has been passed, and appropriation of \$900 to be used for that purpose has been sent to finance committee. Appropriation of \$7,000 for macadamizing Providence St. to city line has also been sent to finance committee.

Chattanooga, Tenn.—The Riverside Drive Commission has finally settled on northern route for drive and directed Chairman Parks to advertise for bids for chert street from East Chattanooga to Citico creek, bids to be in hands of commission not later than Oct. 1.

Knoxville, Tenn.—Appropriation of \$7,000 for Mascot pike work has been ordered.

Knoxville, Tenn.—Citizens living on Anderson St. have signed petition that will be presented to City Commissioners requesting that Anderson Ave. be declared an improvement district and be paved, under abutting property law, from Central St. to Cornelia St.

Maryville, Tenn.—Election has been ordered by Blount County Comrs. to vote on \$300,000 additional bonds for construction of roads.

Dallas, Tex.—Paving of Pearl St. is being urged.

Dallas, Tex.—Resolution has been adopted for sidewalks on Denver St. and on Van Buren St.

El Paso, Tex.—Upon motion of Alderman W. S. Clayton, City Council has adopted recommendation asking that city, through its Council, ascertain what blocks 69, 70, 98 and 99 and fractions of blocks 107, 144 and 35, Alexander's addition, can be purchased for, with view of city buying them through bond issue for purpose of completing proposed scenic highway on rim of mesa and scenic park.

Kountze, Tex.—Saratoga and Batson Road District in Hardin County, will vote on \$125,000 bond issue for road construction. W. W. Davis is County Judge.

Lockhart, Tex.—Extension of road from San Antonio-Austin Post Road at San Marcos through Lockhart to Houston is being discussed.

San Antonio, Tex.—County Commissioners have ordered number of improvements made on several roads in county. Following roads were ordered graded and graveled: The Quintana Road, from Pearsall Road to Cassin Road; the Cuppler Road, from Pearsall Road to Castroville Road. Following roads were ordered retopped: The Comerset Road, from San Pedro Creek, in city limits, to Leon Creek; Pearsall Road, from Union Stock Yards to end of gravel on other side of Leon Creek. Cost of this work is to be charged to road fund under bond issue apportioned to Commissioners' Precinct No. 1.

Texarkana, Tex.—Proposition has been submitted by Bert Hahan Construction Co., of Dallas, to City Council, for paving Front St. and repairing Broad St. Paving of Front St. involves expenditure of approximately \$45,000, together with about \$12,000 additional for guttering, and, according to company's statement, they can pave Front St. with brick removed from Broad St. and repave Broad St. with rock asphalt for this sum of money.

Salt Lake City, Utah.—E. R. Morgan, state road engineer, has authorized surveys for macadam state highway in Empire gulch, immediately beyond Park City. General plan for road improvement also calls for building nearly mile of concrete road at end of main street in Park City, which will be directly connected with Empire gulch highway.

Bellaire, W. Va.—Ordinance has been passed declaring it necessary to proceed with improvement of Franklin St. from 44th to three lots south of 47th by grading and paving.

Seattle, Wash.—Plans have been approved for grading of West Juneau St., paving of 23d Ave. North and laying asphalt top on Elliott Ave.

Oconto, Wis.—Citizens have authorized \$40,000 bond issue for improving several streets.

CONTRACTS AWARDED.

Birmingham, Ala.—To Southern Bitulithic Company, Birmingham, for paving North 34th and North 25th Sts., at \$6,174 and \$15,450, respectively.

Linden, Ala.—By Marengo County Commissioners, to J. J. Dunnivant, Linden, to construct about 2½ or 3 miles gravel road, at cost of \$7,000. J. B. Converse is Engineer, Selma, Ala.

Phoenix, Ariz.—For constructing Greenlee-Link-Clifton-Solomonville highway to Clay & Ruth, Morenci, at \$39,930.

Richmond, Cal.—For improvement of Soto Avenue to Frank Aquilas at \$14,221.04.

Riverside, Cal.—By County Highway Commissioners to Riverside Portland Cement Co. contract for furnishing 125,000 bbls. cement at \$1.34 per bbl.

Connecticut.—Following contracts have been awarded as follows: Bristol, 4,700 ft. concrete construction and 6,992 ft. gravel, to Chas H. Terry, Bristol, at \$23,347; Old Saybrook, 1,755 lin. ft. concrete construction, Donahue Bros., Middletown, \$2,800; Griswold, 6,075 lin. ft. concrete and 17,800 lin. ft. native stone reinforced construction, Fred H. Gilbert, Jewett City, \$18,314; Manchester, \$6,700 lin. ft. reinforced concrete on Main St., to A. C. Sternberg Bros., at \$15,416; Danbury, 2,884 lin. ft. amiesite, White St., to C. T. Eastburn Co., Mt. Vernon, N. Y., at \$12,457.

Hartford, Conn.—By Water Board, to Longhi Bros., Torrington, for constructing Burlington Gravel road at \$23,382.

Washington, D. C.—For 70,000 sq. yds. cement sidewalk in Dist. of Columbia to E. G. Gummel, Washington. For Class A 96 cts. per sq. yd. and Class B \$1.16 per sq. yd.

Wallace, Idaho.—For 16,000 sq. yds. bitulithic pavement on 5th St. to Warren Construction Co., Portland, Ore., at \$1.90 per sq. yd.

Galesburg, Ill.—For constructing North Cedar St. pavement to J. B. McAuley, Galesburg, at \$28,589.

Springfield, Ill.—For construction of brick pavement in Ash St. from 6th to 15th, to J. E. Bretz, Springfield, at \$1.625 per sq. yd. for pavement and 55 cts. per lin. ft. for sandstone curb.

Waukegan, Ill.—Contracts have been awarded for construction of various sidewalks on N. Jackson, N. Chapel Sts. and Lucia and Lloyd Aves. to Anton Dudek, of North Chicago; also contracts for construction of sidewalks on Williams and Walnut Sts. to Leo Del Haye, of Waukegan.

Waukegan, Ill.—For paving of Washington St. will probably be awarded to Western Improvement Co., Racine, at \$40,470. Other bidders as follows: M. McCugo, Waukegan, \$40,092.75; James Cape & Sons, Racine, \$41,763.50; C. Peterson Co., Kenosha, \$41,949.75. Bids were also opened for paving S. Utica St. near new Federal Bldg. M. McCugo, of this city, was lowest bidder, bids being as follows: M. McCugo, Waukegan, \$4,812.31; James Cape & Sons, Racine, \$4,147.98; Western Improvement Co., Racine, \$4,917.78.

Evansville, Ind.—For paving Main St. with brick, by Board of Works, to Reichert & Stinchfield Co., Evansville, at \$1.98 per sq. yd.

Fowler, Ind.—Contract for new Brest crushed stone road has been let by County Commissioners to L. W. Rock Construction Co., of Fowler, at \$11,345. It is located in Hickory Grove Twp., is 3 miles long, 12 ft. wide, with dirt side track, and is to be 10 ins. deep. Others submitting bids were: William Mahoney, Lafayette, \$11,888; Grover Stillabower, Fowler, \$11,875; Ward & Griffin, Otterbein, \$12,700; E. B. Steeley, Montmorenci, \$12,299.89; A. J. Freeland, Fowler, \$12,400; P. J. Kennedy, Templeton, \$12,500; Leehigh Stone Co., Kankakee, \$12,840.

Indianapolis, Ind.—By Board of Park Commissioners contract to Union Engineering Co. for sidewalks in Fall Creek Blvd., from 32d to 34th Sts.

Lovett, Ind.—By County Commissioners for construction of Hanzel Pike to Colter & White at \$2,265.

Licking, Ind.—To L. W. Rook Construction Co., Dunkirk, Ind., contract for Traut road, at about \$17,900.

Milton, Ind.—By Town Board, contract for sidewalks, crossings at alleys and streets, to T. J. Connell, at 16½ cts. per sq. ft.

South Bend, Ind.—A preliminary contract for paving Cottage Grove Ave., from Lincoln Way, W. (Michigan Ave.), to Pottage Ave., with asphalt, has been awarded to Rankert & Eggleston, of South Bend, for \$12,911.80 by Board of Works.

Council Bluffs, Ia.—Contract for construction of 19,000 feet of curbing has been given to Peter Nelson at 60 cents a lin. ft. for curb work and 25½ cents a cu. yd. for grading.

Lexington, Ky.—For improvement of High St., from Rose St. west to Maxwell St., to Casey-Reed Co., Lexington, Ky., at following bid: Asphalt paving, type "C," \$1 per sq. yd.; header stone, 50c. per lin. ft.; concrete, \$4.80 per cu. yd.; combined cement curb and gutter, 60c. per lin. ft.; cement gutters, \$1.50

per sq. yd.; cement sidewalks, 15c. per sq. ft.; resetting old curb, 15c. per lin. ft.; cement curb with steel protection radii, \$1 per lin. ft.; resetting manhole tops, \$2.50 each; manholes, new, \$30 each; resetting old catch basins, \$2.50 each; catch basins, new, \$40 each; flush tanks, \$55 each; five-inch pipes, 50c. per lin. ft.; eight-inch pipes, 70c. per lin. ft.; ten-inch pipes, 80c. per lin. ft.; twelve-inch pipes, 90c. per lin. ft.; fifteen-inch pipes, \$1 per lin. ft.; eighteen-inch pipes, \$1.10 per lin. ft.; twenty-four-inch pipes, \$2 per lin. ft. Contracts for improvement of various other streets have been awarded to same firm as follows: (1) Bell Pl., from Main St. to Sayre Ave.; (2) Sayre Ave., entire length; (3) Bell Court, west, entire length; (4) Russell Ave., from Forest Ave. to Blair Ave.; (5) Bell Court, east, entire length; (6) Delmar Ave., entire length; (7) Ormsby Ave., entire length; (8) Blair Ave., entire length; (9) Boonesboro Ave., entire length, by the construction of the roadways thereof with sheet asphalt paving, type "C," with Trinidad Pitch Lake asphalt in accordance with Ordinance No. 422, at following bid: Asphalt pavement, type "C," \$1 per sq. yd.; header stone, 50c. per lin. ft.; concrete, \$4.50 per cu. yd.; combined cement curb and gutter, 60c. per lin. ft.; cement gutters, \$1.50 per cu. yd.; cement sidewalks, 15c. per sq. ft. cement curb with steel protection radii, \$1 per lin. ft.; resetting manhole tops, \$2.50 each; manholes, new, \$30 each; resetting old catch basins, \$2.50 each; catch basins, new, \$40 each; five-inch pipes, 50c. per lin. ft.; eight-inch pipes, 70c. per lin. ft.; flush tanks where constructed, \$55 each.

Louisville, Ky.—By Board of Public Works, to Roscoe Butler, contracts for construction of number of concrete sidewalks at following points: Both sides of 41st St., from Broadway to Chestnut; south side of Market St., from 29th St. east, 54 ft., and from 29th St. west 220 ft.; east side of Preston St., from Brook to Gray, and south side of Rupp, from Dandridge to Logan.

Winchester, Ky.—J. C. Codell, of near this city, has been awarded contract for construction of macadam streets in Hazard, Perry Co. Contract amounts to about \$15,000.

Whitesburg, Ky.—By Letcher County Fiscal Court, to Munday & Barnes to construct 6 miles roadway from Mayking to Kona.

Attleboro, Mass.—For repairing Park St. to Boston Co. Tarr roads, with 4-in. foundation, will be laid from arch to corner of North Main, Park and County Sts.

Boston, Mass.—Bids for widening Merrimac St., in Lawrence, along Shawsheen River, for building retaining wall in river, and for dredging channel, have been opened by Essex County Commissioners. Lowest figure of eight bids was \$15,630, submitted by Merrimac Construction Co., of Lawrence, to whom contract was awarded. Other bids were: W. M. Tike & Son, of Lawrence, \$16,975.50; T. Stuart & Son Co., of Newton, \$17,076.25; William H. Callahan, of Lawrence, \$19,590; J. W. Buswell, of Salisbury, \$20,305; John Cashman & Sons Co., of Boston, \$21,495; M. L. Mahoney estate, of Lawrence, \$23,485; Timothy A. Moynihan, of South Hamilton, \$25,992.50.

Holyoke, Mass.—To P. J. Kennedy, Inc., Holyoke, Mass., contract for paving north side of Cabot St. from Main St. to third level canal. He is to lay 2½-in. asphalt blocks at \$2.38 a yd.

New Bedford, Mass.—Contracts for street surfacing work have been awarded to Warren Bros. Co., 59 Temple Pl., Boston, for endurite, and Simpson Bros., 166 Devonshire St., Boston, for hassam block paving, low bidders for this pavement. Price for endurite was \$1.50 a sq. yd., and for block paving \$1.95 a sq. yd., and \$2,641.51 to complete work already started.

Somerville, Mass.—By Massachusetts Highway Commission, Boston, to John A. Gaffey, 19 Prince St., Medford, for 2,400 ft. road work at \$8.138.

Aurora, Minn.—Contract for paving Jackson St. and intersecting streets to the alley lines has been awarded to Lawrence & McCann, of Eveleth, by Village Council. The paving will be bitulithic and price will be \$2.50 per sq. yd.

Duluth, Minn.—Contract for concreting 55th alley from Ramsey St. to Northern Pacific right of way has been awarded to W. H. Kiltin, on his bid of \$1,099.82.

Grand Rapids, Mich.—By Board Wks. to Hilding & Roby, Grand Rapids, for improving National Ave., N. W., at \$16,194.

Cape Girardeau, Mo.—By city, to Har-

mon Loeffel, at \$11,037, to pave Benton St. from Bloomfield to Independence St.

Carlstadt, N. J.—For curbing and guttering of Washington St. to Oscar Kaster, of Carlstadt, at 65 cts. per ft.

Elizabeth, N. J.—Lowest bid received for improvement of Center St. and Spruce Ave. was from Charles Lentz, Rahway, at \$7,847. Bids called for laying of concrete curbs and gutters and macadamizing of both streets from gutter to gutter.

Linden, N. J.—Contracts for street improvements have been awarded by Township Committee as follows: Brunswick Ave., from Peterson Lane to the Elizabeth city line, the C. H. Winans Co., 207 Broad St., Elizabeth; Peterson Lane, from Edgar Road to Brunswick Ave., the C. H. Winans Co.; Grier Ave., from Elizabeth city line to limits of Greater Elizabeth, also McGillivray Place, from Edgar Rd. to Grier Ave., the Weldon Contracting Co., Elizabeth; Lower Rd., from 20th St. to Rahway city line, the C. H. Winans Co.

Matawan, N. J.—By Board of Freeholders, contract for gravel road from Matawan Borough line to Cliffwood Station, 1½ miles in length, to W. H. Flitcroft, of Farmingdale, on his bid of \$2,970.

Newark, N. J.—By Bd. of Works to Alex. J. Milmo, 93 Littleton Ave., Newark, for grading, curbing and paving Bradford Pl., at \$32,265.

Passaic, N. J.—By Bergen County Freeholders, following contracts for county roads: Kinderkernack Road, section 1, from Anderson St., Hackensack, to the Township of Emerson, to George M. Brewster, of Hackensack, \$143,411.12. Wyckoff Road, 2d section, to George F. Brackett, of Ridgewood, \$132,192.21. Maple Ave. Road, from the Passaic River to Township of Hokokus to Uvalde Paving Co., of New York, \$94,070. Terrace Ave. Road, from Hackensack to Hasbrouck Heights, to Di Napoli Torrello, of Hackensack, \$24,098.66. Fort Lee Road, 3d section, from Leonia to the Edgewater Ferry, to Ernest Abrahams, of Hackensack, \$175,533.26. Passaic St., Hackensack, from Hackensack to Maywood, to E. C. Humphrey, of Hackensack, \$22,933.39. Paramus Road, from Arcola to Franklin Township, to E. C. Humphrey, of Hackensack, \$80,266.24. Teaneck Road, to E. C. Humphrey, of Hackensack, \$35,066.81. Total amount of money which will be expended for these county road improvements will reach \$706,000.

Geneva, N. Y.—The J. W. Brennan Construction Co., of this city, has been awarded contract for building Geneva-Lyons highway. Bid was about \$30,000 for road 2.9 miles long. Concrete will be used.

Rochester, N. Y.—See 'Miscellaneous.'

Schenectady, N. Y.—To T. R. Crane, Schenectady, N. Y., contract for repaving Hamilton St. with cobblestones at \$1,260.

Saranac Lake, N. Y.—Boynton & McNally, of Keeseville, were low bidders in contract for construction of 6.78 miles of road, comprising Part One of highway between Schroon Lake and North Hudson in Essex County. The Keeseville firm offered to do work for \$34,440.36. Other bidders were as follows: Richard Hopkins, Troy, \$38,319.15; Joseph Walker Construction Co., Albany, \$39,997.60; Gruner & Hallenbeck, Harbman, \$36,924.75; W. L. Lawton, Glens Falls, \$39,383.35; Flood & Van Wirt Co., Hudson Falls, \$35,500.29.

White Plains, N. Y.—To Hayes Contracting Co. contract for construction of long stretch of state road through White Plains.

Wilmington, N. C.—By city council to Atlantic Bitulithic Co., Florence, S. C., contract for paving Market St., 10th to 17th, with bitulithic, at \$2.19 a sq. yd., amounting to approximately \$40,000.

Brewster, O.—By Brewster Council, contract for grading streets to Wise Bros., of Canton, the lowest bidders. Work is to be started in a few days. Streets to be graded are 2d, 4th, 5th, McKinley Ave. and Jefferson Ave.

Cleveland, O.—By Director Pub. Service to Cleveland Paving & Constr. Co., Cleveland, O., for grading, draining, curbing, paving with 5-in. brick on 6-in. concrete and improving Jennings Road at \$19,556.

Columbus, O.—Six contracts aggregating \$85,148 have been awarded by City Board of Control. The Cleveland Trinidad Asphalt Co., 420 Lakeside Ave., Cleveland, was given contract to pave Third Ave. with asphalt from Cleveland Ave. to St. Clair Ave. on its bid of \$25,512, and Starr Ave. from Cleveland to

St. Clair on its bid of \$20,595. Contract for paving Bryden Road with brick from Miller Ave. to Morrison Ave. was let to W. M. Graham, Columbus, at \$6,517; Reynolds Ave., Cleveland Ave. to St. Clair, brick, to E. F. Patterson at \$20,456, and Buckingham St., Neilston St. to Cleveland Ave., was awarded to A. W. Burns & Co., at \$10,805. P. J. Connelly was given contract for constructing sidewalk in West Broad St. in front of Glenwood Park on his bid of \$900.

Defiance, O.—For paving with stone canal road by Board County Comrs. to Schneider Bros., Richmond, Ind., at \$29,750.

Leetonia, O.—Hepburn & McClain, of Lisbon, were low bidders for construction of Front St. paving. Contract will shortly be awarded. The street will be paved with brick. Five bids were received as follows: Hepburn & McClain and W. N. Wright, Lisbon; Frank Manilla and Buell & Baker, Salem; T. J. McGuire, Pittsburgh. Bid of Hepburn & McClain was \$2,130.

Toledo, O.—By Bd. Control contracts as follows: Palmer St., with vitrified brick, to Harris & Tansey, Toledo, at \$9,386, and Grand Ave., with vitrified brick, to Peter H. Watters, at \$4,836.

Tiffin, O.—By County Commissioners for grading at Bridge No. 49 to F. X. Wahrer at \$131.50. For grading at Riden Hill, near Old Fort, to Clarence Arter at \$311.37, and for grading at Abbott River bridge No. 110, near Ft. Seneca, to Earl Lebold at \$215.

Hillsboro, Ore.—For constructing Capitol Highway, to Jeffery & Bufton, Failing Building, Portland, at about \$18,698.

Erie, Pa.—Contract has been awarded J. & M. Doyle, Erie, for paving, draining and curbing Pine Ave., from 28th St. to city limits, for \$12,865. City Engineer Briggs' estimate was \$16,000. Same firm offered bid pave Plum St., from 12th St. to the E. & P. R. R. tracks, for \$2,252 with asphalt, and for \$2,582 with brick. City Engineer Briggs' estimate was \$2,400.

Erie, Pa.—Contract for laying cement sidewalks in Liberty St., from 12th to 14th St., under new subway has been awarded to A. Tomato for \$42,650.

Erie, Pa.—To Mayor Bros. Construction Co., Erie, Pa., contract for paving Ross St., from Third to Fifth, for \$3,971.60. Mayor Bros. Construction Co. was only bidder for repaving Ninth St., from State to German. This bid was \$7,656, contractors being allowed to retain old stone. Bid was referred to superintendent of department of streets and public improvements.

Franklin, Pa.—For paving two streets, to E. H. Brua, Hollidaysburg, at about \$14,866.

Harrisburg, Pa.—Contract for State Aid highway, approximating 2 miles in length, has been awarded by State Highway Commissioner Bigelow. Road, which is of brick block paving, is situated in North Sewickley Twp., Beaver Co. There were eleven bidders, the prices ranging from \$44,922.24 to \$54,211.76. Low bidder, R. B. Taylor, of Bellefonte, Pa., neglected to sign his bid, thus making it impossible to award it on account of its illegality. John L. Elder, of Ebensburg, Pa., next bidder, received contract, at his price of \$45,433.66.

Lewistown, Pa.—Contract for paving of two streets has been awarded to J. B. Trexler, 165 W. Windsor St., Reading, for \$20,356.20. Totals of other three bidders were: R. W. Henson, of Geneva, N. Y., \$20,812.94; John L. Elder, of Ebensburg, Pa., \$20,891.17; The Gregory Paving Co., of Lewistown, \$22,236.47. Detailed bids were as follows: Gregory—S. Dorcas, \$1.96; S. Main, \$2.12; ret. stone, 35c. Trexler—S. Dorcas, \$2; S. Main, \$1.90; ret. stone, 30c. Elder—S. Dorcas, \$1.95; S. Main, \$1.97; ret. stone, 30c. Henson—S. Dorcas, \$1.92; S. Main, \$1.97; ret. stone, 25c. Only S. Dorcas St. will be grouted, Mr. Trexler's work for this extra work being 10c. per sq. yd., or total of \$2.10 per sq. yd.

New Castle, Pa.—For grading and guttering of Etna St., to Burns Bros., New Castle, at \$1,320.

Philadelphia, Pa.—For paving portions of Howard St. to John Devlin, Jr., 1253 No. Hancock St., at \$38,410; Grant Ave. to Union Paving Co., 30th and Locust St., at \$17,853, and for resurfacing part of Southampton Ave. to Union Paving Co. at \$11,493.

Clarksville, Tenn.—By Co. Rd. Comrs., for constructing government road between Clarksville and Port Royal, to A. A. Smith, Mt. Pleasant, \$34,428.

Dyersburg, Tenn.—To West Construc-

tion Co., Chattanooga, for paving number of streets with asphalt.

Knoxville, Tenn.—To J. A. Burkhardt, Knoxville, for improving Rutledge Pike, at \$6,020.

Knoxville, Tenn.—For macadamizing Wright's Ferry Road to Dykes & Co., at \$1.47 per sq. yd.

Galveston, Tex.—Contract for supplying county with about 21,000 cu. yds. of shell for lateral roads has been awarded to W. D. Haden, Galveston, Tex., at 69 cts. per cu. yd. The shell is to be consigned as follows: Alta Loma, 4,000 cu. yds.; Algora, 3,200 yds.; Arcadia, 7,200 yds.; Hitchcock, 4,080 yds.; League City, 1,600 yds.; Dickinson, 1,600 yds.

Memphis, Tenn.—By Shelby County Commissioners, to B. F. Williford, to grade and gravel Southern Ave. and construct retaining wall along roadway.

Lockhart, Tex.—By Caldwell County Commissioners, to Van B. Flowers, of Lockhart, to repair 18 miles graded roads on San Marcos and Kyle Road.

Waco, Tex.—For supplying asphalt and asphaltic oil for road work in Road Improvement Dist. No. 1, McLennan County, to Texas Co., Beaumont, at \$31,826; about 600,000 gals. will be required for the work.

Salt Lake City, Utah.—On bid of \$25,595.74 Parrott Bros. & Co., Salt Lake City, was awarded contract for sidewalks between Fifth East and Tenth East and Twelfth South and Thirteenth South.

Richmond, Va.—By city, to Nicholas & Henley, for granolithic curbing and guttering in Fairmount, to cost \$16,000; A. W. Maynard, of Richmond, will lay brick sidewalks on both sides of Lester St., from Maple to Nicholson, and A. Q. Billings will lay granolithic sidewalks on both sides of Floyd Ave., from Robinson St. to corporate limits.

Moundsville, W. Va.—By city, to Springer & Springer, Wellsburg, W. Va., to pave Western Ave. from 7th St. to corporation limits. Work consists of about 5,000 sq. yds.

Wheeling, W. Va.—To Ball Engineering Co. for macadamizing 23,000 yds. of roadway on Cherry Hill, Wheeling and Elm Grove Roads.

Seattle, Wash.—Bids submitted by S. H. Starr was lowest at \$2,255.60 for construction of sidewalks on Etruria St., and bid of J. J. Maney at \$20,445.20 was lowest for paving 47th Ave. N. E.

Kerrisdale, B. C.—For paving about ½ of mile on Yew St. to Ledingham & Cooper, Vancouver, B. C., at about \$13,000.

Port Arthur, Ont.—For widening roadway on May St. to Canadian Resource & Development Co., Ltd.

Sandwich, Ont.—For paving Bedford St., from End St. to southerly limits, to Canadian Dolarway Paving Co., Windsor.

Weston, Ont.—For constructing Main St. in Little York at \$60,000 to Construction & Paving Co., Toronto.

SEWERAGE

Richmond, Cal.—City Engineer H. D. Chapman has about finished his plans for main sewer to be constructed for western section of city.

Bridgeport, Conn.—Following sewer improvements have been ordered: Sewer wells constructed at corners of Park Ave. and Lorraine St.; sewer in Boston Ave., from East Main St. to Kossuth St.; sewer in East Eaton St.; sewer constructed in East Ave., from Boston to Barnum Ave.; sewer constructed in Capitol Ave. west 640 ft. from Madison Ave.

Richmond, Cal.—City Engineer H. P. Chapman has about finished his plans for main sewer to be constructed for western section of city. It will empty into Standard Oil Co.'s tidal canal, which in turn empties into San Pablo Bay. With this main laid, western part of the city will have complete sanitary system.

Wilmington, Del.—Construction of sewer along Brandywine Creek to care for sewage of Henry Clay and vicinity is being considered.

Wilmington, Del.—Extension of Rising Sun sewer is petitioned for.

Ocala, Fla.—City will vote Oct. 27 on \$100,000 bond issue to construct sewer system.

Ocala, Fla.—See "miscellaneous." Hopeville, Ga.—Bonds in sum of \$14,000 have been voted for sewers.

Lafayette, Ga.—Council has ordered election for bonds for purpose of installing sewerage system.

Macon, Ga.—Plans and specifications will be prepared by City Engineer Gallard to construct sanitary sewers and septic tank for Tybee District, to cost \$7,000, of which \$4,000 will be for sewer line and \$3,000 for tank.

Indianapolis, Ind.—Board of Works will construct local sewer in Hazel St. and Garfield Ave.

Mishawaka, Ind.—An improvement resolution has been adopted by Board of Public Works authorizing construction of lateral sewer on East Lawrence St. from Oak to River Sts.

Pera, Ind.—Bids will be advertised for sewer between 2d and 3d Sts., and for sewer from Water to Benton Sts.

Council Bluffs, Ia.—Resolution ordering advertising for bids for about 3,000 ft. of sewer has been adopted.

Creston, Ia.—Bids will be received by J. P. Golden, City Clerk, until 8 p. m., Sept. 30, for construction of sanitary sewers in Districts from No. 7 to No. 35. Quantities are as follows: 1,220 ft. of 12-in. sewer at 4.5 ft. average cut; 2,100 ft. of 10-in. sewer at 4.5 ft. average cut; 740 ft. of 10-in. sewer at 6.2 ft. average cut; 883 ft. of 8-in. sewer at 4 to 6 ft. average cut; 6,150 ft. of 8-in. sewer at 6 to 8 ft. average cut; 1,740 ft. of 8-in. sewer at 8 to 10 ft. average cut; 244 ft. of 6-in. sewer at less than 4 ft. average cut; 6,700 ft. of 6-in. sewer at 4 to 6 ft. average cut; 2,645 ft. of 6-in. sewer at 6 to 8 ft. average cut; 3,490 ft. of 6-in. sewer at 8 to 10 ft. average cut; 1,050 ft. of 6-in. sewer at 10 to 12 ft. average cut; 44 manholes, totaling 312.4 ft. and 26 lampholes, totaling 193.5 ft. Theo. S. DeLay is City Engineer.

Dubuque, Ia.—City Council will construct 8-in. tile pipe sanitary sewer in 24th St. J. J. Shea is City Recorder.

Oskaloosa, Ia.—Sewer system will be constructed in Penn College addition.

Leavenworth, Kan.—Resolution has been adopted for construction of 8-in. sanitary sewer of vitrified pipe, with flush tank, beginning in street north of Terminal Freight Depot, and south of Lot 21, Block "H," Rankin's Subdivision, extending in easterly direction along street to Seventh St., thence along Seventh St. to east and west alley between Cherokee and Delaware Sts. and connecting with present sewer in center of alley. J. H. Kirmeyer is city clerk.

Ludlow, Ky.—Sewer bond issue in sum of \$25,000 will be voted on Nov. 3.

Paducah, Ky.—Plans and specifications for proposed third district sewer to drain west and north sides of Paducah have been completed by Aetna Engineering Co., of Chicago.

Fall River, Mass.—Of nine bids received by Reservoir Commission for construction of intercepting drain at North Watuppa Pond there are only three that figure less than \$200,000, amount of loan authorized by Legislature. These bids are to be considered shortly by commission. Bids were as follows: Hanscom Construction Co., Boston, \$173,833.75; W. H. Arthur, Stamford, Conn., \$179,473; T. Stuart & Son Co., Newton, Mass., \$193,787.50; Bruno & Petit, Boston, \$201,859.50; Mason, Hilton Co., New York, \$204,489.50; Fred T. Ley & Co., Springfield, Mass., \$206,207.15; Leo E. Kelly, Inc., Brooklyn, \$216,597.50; Whiting-Turner Construction Co., Baltimore, Md., \$236,972.70; C. H. Sears, Fall River, \$239,962.65.

Pittsfield, Mass.—Orders have been adopted providing \$35,000 for new sewers and \$5,000 for water extensions.

Pittsfield, Mass.—Order has been adopted for \$5,000 for sewage disposal and providing bonds issue for same.

Springfield, Mass.—Supervisors have ordered extension of White St. sewer southward 500 ft., at cost of \$3,000. It is concrete trunk sewer 4 ft. in diameter. Cluster of smaller sewers have also been ordered, none of them costing more than \$600.

Duluth, Minn.—Petition has been received for sanitary sewers in Eighth alley from 40th to 39th Aves. west, and in 39th Ave. to connect with sewer in Seventh alley, and another was presented for sanitary sewer in Morse St. from Lake Ave. to lake shore opposite Wieland flats. Sanitary sewers were ordered in Wilkyns Ave. from Oxford St. northerly 367 ft. and in Seventh alley between 19th and 18th Aves. east.

St. Paul, Minn.—Following final orders have been passed by City Council: Building a sewer on Carroll St., from Snelling Ave. to Asbury St., at cost of \$971, or \$1.69 a front foot, and constructing sewer on Minnehaha St., between Western Ave. and Arundel St., at cost of \$1,528, or \$1.40 a front foot.

St. Paul, Minn.—Ocean street sewer No. 2 has been approved by council. It will be constructed early next season. The estimated cost is \$31,417.28.

Camden, N. J.—Ordinance has been adopted authorizing construction of sewers, culverts or drains in and along

23d St., from River Ave. to Hayes Ave., Berwick St., from Morse St. to Boyd St.; beginning at end of present sewer on Marlton Ave.; thence on Marlton Ave. to Midvale Ave., to Berkley St., to Garden St., to Eva St., to Hillside Ave., to Ella St. to Fountain Ave., to Waldorf Ave., to Burwood Ave., to Highland Ave., to 36th St., and north from Highland Ave. to the Camden and Burlington County Railroad on 32d, 33d, 34th, 35th and 36th Sts. Jas. E. Hewitt is president of City council.

Plainfield, N. J.—Form of contract for construction of trunk line sewer to be built by Plainfield, North Plainfield and Dunellen, with disposal beds at Darling farm in Middlesex borough has just been adopted. Contract contemplates expenditure of more than \$300,000. Bids for doing work will be advertised for, and sewer committee will receive them at Plainfield on Oct. 7.

Trenton, N. J.—Ordinance has been passed authorizing construction and maintenance of sewage disposal plant or works.

Trenton, N. J.—Ordinance has been adopted to authorize construction of drain No. 113, in East Clinton Ave.

Rochester, N. Y.—See "Miscellaneous."

Cincinnati, O.—Ordinance for apportioning cost of sewer in O'Fallon Ave. from Ninth to Tenth Ave. has been passed.

Dayton, O.—Improvement resolutions have been adopted providing for construction of sanitary sewers in district 6 and declaring it necessary to improve Norman Ave., from Main St. to Darr St.

Geneva, O.—Ordinance has been adopted for construction of 8-in. sanitary sewers in Blaine and Orchard Sts.

Geneva, O.—Preliminary plans for new disposal plant will shortly be completed.

Newark, O.—Ordinance has been adopted for improvement of East Locust St. by construction of drainage sewer. J. S. Woodward is Clerk of Council.

Clifton Heights, Pa.—Installation of sewage disposal plant is being discussed.

Dubois, Pa.—Ordinance has been passed for construction of sewer on East Scribner Ave.

Easton, Pa.—Sewerage plant improvement bonds in sum of \$300,000 will be voted on Sept. 22.

Erie, Pa.—Ordinance has been passed providing for construction of fifteen (15) inch diameter lateral sanitary sewer in 14th St., extending from Plum St. to Poplar St., and in Poplar St., from 14th to 15th St., and in 15th St., from Poplar to Cherry St., together with necessary house connections.

Erie, Pa.—Ordinance has been passed providing for construction of 9-in. diameter lateral sanitary sewer in Raspberry St., extending from 18th St. to 20th St. and west in 20th St. 630 ft. more or less, together with necessary house connections. M. J. Henry is Clerk, City Council.

Harrisburg, Pa.—Commissioner Lynch has opened bids for construction of new sewers in Cumberland, Paxton and MacLay Sts. Bids, which will probably be presented to Council next week, follow: Cumberland and Paxton Sts., John A. Stucker, \$5,779; G. W. Ensign, \$5,331.70; William H. Opperman, \$5,379, and Henry Opperman, \$5,292. For the MacLay St. sewer the bids were: Stucker, \$244; Ensign, \$282.56; W. H. Opperman, \$265, and Henry Opperman, \$296.

Jersey Shore, Pa.—Special election will be held in this borough on Sept. 15 to decide bond issue of \$8,000 for sewer running through Third and Fourth Wards.

Johnstown, Pa.—Construction of sewer in Bridge St. is being discussed.

Muncy, Pa.—Permit of Health Department of Pennsylvania for construction of extension of sewer system of boroughs as provided for in plans has been filed for record by Borough Council of Muncy.

Woonsocket, R. I.—Resolution has been passed providing for sewer on Diamond Hill road from Social to Rathbun St., and \$775 has been appropriated for that purpose.

Laredo, Tex.—City has voted \$24,000 in bonds for sewer construction.

Wharton, Tex.—City is considering improvement of sewer system.

Bristol, Va.—City will construct sewer along right of way of Southern Ry. near Ashe St., to connect with 20-in. sewer in 4th St. Cost, about \$6,000.

Burlington, Vt.—Resolution to construct sewer in Proctor Pl. to connect present sewers in Lakeside with present trunk line sewer in ravine has been re-

ferred to Street Commissioners; also petition to construct extension to sewer in South Prospect St. 450 ft. southerly.

Charleston, W. Va.—City is planning to construct about 9 miles sewers ranging from 72 to 8-in. in diameter, with manholes, catch-basins, etc.

Sheboygan, Wis.—Bonds in sum of \$40,000 will be issued for connecting sewers and building water works system.

CONTRACTS AWARDED.

Los Angeles, Cal.—For constructing sewer in Brent St., from E. 4th. to E. 8th Sts., to J. C. Wukojewich at \$34,800; also contract for constructing sewer in Harrison Ave., between Soto and Tremont Sts., at \$11,559.

Los Angeles, Cal.—To B. Wucetich, contract by Board of Public Works for construction of sanitary sewers in Vignes St. district. Bid was \$17,364.

San Benito, Cal.—To L. T. McFadden at \$11,595 for installing sewer system in northern section of city.

Miami, Fla.—By city to Southern Asphalt and Construction Co., Birmingham, Ala., for constructing sewers.

Chicago, Ill.—By Board of Local Improvements, for constructing tile pipe sewer, with new brick manholes and new brick catch-basins complete, constructing concrete curb, grading and paving with vitrified paving brick on 2 in. of sand and 6 in. of Portland cement concrete, joints filled with coal tar, surface dressed with ¼ in. sand, the roadway of alley between Bryn Mawr Ave., Catalpa Ave., Wayne Ave. and Glenwood Ave. to Central Paving Co., 179 W. Washington St. Also for adjusting sewer catch basins, constructing and connecting catch basin inlets, constructing new brick catch basins complete, curbing with sandstone curbstones supported at each joint by 1½ cu. ft. Portland cement concrete, grading and paving with vitrified paving brick on 2 ins. of sand and 6 ins. of Portland cement concrete, joints filled with coal tar, surface dressed with ¼ in. of sand, the roadway of N. Keazle Ave. from northeasterly line of Elston Ave. northwesterly to south curb line of Montrose Ave., to Citizens Construction Co., 133 W. Washington St. And for adjusting sewer manholes and catch basins, constructing and connecting catch basin inlets, constructing new catch basins complete, curbing with sandstone curbstones supported at each joint by 2 cu. ft. of Portland cement concrete, grading and paving with repressed vitrified paving brick on 2 ins. of sand and 6 ins. of Portland cement concrete, joints filled with asphaltic filler, surface dressed with ¼ in. of sand, the roadway of E. 95th St., from east line of Cottage Grove Ave. produced south to east line of S. State St., to James A. Sackley Co., 133 W. Washington St.

Clinton, Ia.—Two sewer contracts have been awarded to Thos. Carey & Son, of Clinton. One of these was for construction of sewer in alley in block 41, between Seventh and Eighth Aves. and Fifth and Sixth Sts. Proposals were: Rundgren Bros., \$1,523.78; Thomas Carey & Son, \$1,382. Bids for construction of sewer in block 17, Lyons between Third and Fourth Sts. and Main and Exchange were: Fred Bodenhofer, \$900.15; Rundgren Bros., \$824.75; Thomas Carey & Son, \$679.25.

Gary, Ind.—By Board of Public Works to M. W. Holben, Gary, Ind., at \$6,163 for constructing local sewer No. 39.

Charlton, Ia.—For about 18 miles of sewer, including three septic basins, to Turner Improvement Co., Des Moines, at \$120,155.

Council Bluffs, Ia.—Contract for construction of 26,000 feet of sewer has been given to E. A. Wickham, Council Bluffs, who was lowest bidder.

Lexington, Ky.—For construction of sanitary sewer on West Main St. to J. H. Hostetter Co. at following bid: Eight-inch pipe, 85c. per ft.; five-inch pipe, 60c. per ft.; five-inch Y branches on eight-inch bid, 50c. each; manholes, \$45 each; flush tanks, \$65 each; rock excavation, \$5 per cu. yd.; repaving, \$1.50 per sq. yd.

Paducah, Ky.—Bid of Minneapolis Machine & Sewer Co. for carload of sewer pipe has been accepted.

Baton Rouge, La.—To E. M. Sheffield, Houston, Tex., at \$19,700, to construct 36,000 lin. ft. vitrified pipe sewers from 6 to 12 in. diameter, etc. John J. Munding is City Engineer.

Boston, Mass.—By Metropolitan Water and Sewerage Board, for constructing c.i. outfall sewer at Nut Island and in Boston Harbor to W. H. Ellis & Sons Co., 479 Meridian St., at \$34,790. Sewer has length of about 1,400 ft. and will be laid

in dredged trench, supported by pile foundation.

Bay City, Mich.—For constructing 12-in. socket tile sewer in center of Fisher Ave. to Thos. Kent & Co., at \$448.

Elizabeth, N. J.—Following bids were received for constructing sewer in Anna St., from Division to Henry Sts.: Joseph Viscount, \$938.20; T. Foster Callahan, \$1,061.77; Christian Wade, \$1,039.76; John C. O'Neill, \$1,101.36; M. Rinaldo, \$1,038.52. Contract was later awarded to Viscount.

Linden, N. J.—Lowest bid received for sewer in Hussa St. was from Mathew Wade, Elizabeth, at \$324.02, and for sewer in Wood Ave. from T. Foster Callahan, 207 Broad St., Elizabeth, at \$567.16.

Long Branch, N. J.—To Monmouth Contracting Co., Broad St., Red Bank, N. J., contract for laying of Spring St. sewer, at \$3,952.11.

Passaic, N. J.—Lowest bid for extension to storm water sewer at foot of Mercer St., across Dundee Island, has been submitted by Union Building & Construction Co., Passaic, N. J., at \$2,430.

Perth Amboy, N. J.—Contracts for placing sewers in Carson Ave. and Laurie St. have been awarded to Jens W. Rohr, 333 Smith St., Perth Amboy. Bids follow: Carson Ave.—Jens W. Rohr, 70 cts. per lin. ft. for sewer, \$30 each for manholes; P. J. Monaghan, 80 cts. for sewer and \$39.50 for manholes; Carl Poulsen, 81 cts. for sewer and \$28 for manholes; Martin Hanson, 77 cts. for sewer and \$32 for manholes; Liddle & Pfeiffer, 96 cts. for sewer and \$32 for manholes. Laurie St.—Jens W. Rohr, 83 cts. a lin. ft. for sewer and \$23 each for manholes; P. J. Monaghan, 95 cts. for sewers and \$44 for manholes; Martin Hanson, 90 cts. for sewer and \$35 for manholes; Carl Poulsen, 93 cts. for sewer and \$33 for manholes; Liddle & Pfeiffer, \$1.04 for sewer and \$32 for manholes.

New York City, N. Y.—To Anita Construction Co., 2975 Marion Ave., for constructing sewer in Wood Ave., between White Plains Road and Storow St., at \$10,999.

Rochester, N. Y.—See "Miscellaneous." **Cleveland, O.**—For Contract 2, excavating, transporting and disposing of all material necessary on site for construction of permanent works of South Side Sewage Treatment Work, to Chas. Fath & Co., Cleveland, at \$94,288.

Eugene, Ore.—To Hall & Soleim, contract for construction of lateral sewer in alley between 5th and 6th Aves. West, at \$595.28, and to Ole Soleim for sewer in alley between Washington and Jefferson Sts., at \$1,046.35. Both will be cement pipe.

Meadville, Pa.—The Keystone Construction Co., of Meadville, has been awarded contract for construction of sanitary sewer on Waelde Alley for \$922.60.

Philadelphia, Pa.—For sewers, Sept. 1, as follows: R. P. Bennis, at \$31,730, for Algard, Tyson and Walker Sts.; Robert Higgins, 4642 Lancaster St., at \$30,797, for Cobb's Creek extension from Sansom St. to Market St., and same contractor for Rock Run extension on Ashdale from the Reading tracks to near Front St., at \$47,763; estate of David McMahon, Main and Cheltenham Sts., at \$15,724, for Kemple Ave. through Nedro St.; Peter Ellis, 3342 N. 11th St., Rock Run extension in 7th St., from Olney Ave. to creek near Chew St., at \$24,140; Edward L. Bader, Westmoreland St., east of Casper, to bulkhead of Delaware Ave., \$13,713, and Peoples Bros., 25th & Callowhill Sts., Wingohocking sewer, in Annsbury St., from 5th St. E., at \$16,660.

Nashville, Tenn.—By City Commissioners, to Quinn & Ellis, Nashville, Tenn., at \$1,114.55, for construction of sewer on boulevard from Portland to Compton Ave.

Huntington, W. Va.—By city, to Sluss-Baker Construction Co., at \$75,500, to construct storm sewer in Fourth Ward to Guyandotte River. A. B. Maupin is City Engineer.

Esquimaux, B. C.—To H. Macdonald for construction Sect. D of local sewer system at \$15,000.

WATER SUPPLY

Birmingham, Ala.—Water works bonds in sum of \$4,500,000 will be voted on Sept. 21.

Texarkana, Ark.—Plans have been made for furnishing city with municipal water works plant. Estimated cost, \$299,810.

Pasadena, Cal.—Bond issue of \$289,000 is recommended for improvements to waterworks system as follows: Comple-

tion of payments on Franklin wells purchase, \$15,000; completion of payments on Woodbury system purchase, \$35,000; 12,000,000-gallon reservoir at Sheldon Ave. and Dakota St., \$35,000; 30-in. main from Sunset reservoir to Fair Oaks and Colorado, \$60,697; 16-in. main in Fair Oaks Ave., Colorado to Center, \$11,039.70; 14-in. main in Fair Oaks Ave., Center to California, \$7,453.85; 12-in. main in Fair Oaks Ave., California to Bellefontaine, \$5,415; 8-in. main in Fair Oaks Ave., Bellefontaine to Glenarm, \$4,248.05; 6-in. main in Fair Oaks Ave., Glenarm to Columbia, \$2,455.15; 24-in. main in Colorado St., Fair Oaks to Los Robles, \$24,316; 12-in. main in Walnut St., Fair Oaks to Vernon, \$4,653.50; 16-in. main in Euclid Ave., Colorado to Center, \$7,831.60; 24-in. main from Windsor reservoir to Lincoln Ave. and Montana, \$31,291; 20-in. main in Montana St., Lincoln to Raymond, \$14,306.20; 12-in. main in Broadway, Colorado to Center, \$5,259; 8-in. main in Broadway, Center to California, \$3,174.50; 10-in. main in Hill Ave., Colorado to San Pasqual, \$5,444; 6-in. main in Sierra Bonita Ave., Colorado to California, \$3,966; two 4-in. mains in Orange Grove Ave., Lake to Hill, \$6,222; 8-in. main in Worcester Ave., Colorado to Walnut, \$2,702; 4-in. main in Stevenson Ave., Orange Grove to Washington, \$3,680; total \$289,154.55.

Montrose, Colo.—Surveys are being made to construct water works, to cost about \$140,000. Burns & McDonnell are Engrs., Scarritt Bldg., Kansas City, Mo.

Wilmington, Del.—No bids have been received for \$50,000 worth of bonds, which were to be sold for purpose of installing water meters in houses. Bids will be readvertised.

Ocala, Fla.—See "Miscellaneous." **St. Augustine, Fla.**—Extension of water mains is being planned in various streets at cost of \$7,710.

Athens, Ga.—City is said to be planning to extend water works intake at expenditure of \$20,000. J. W. Barnett is City Engr.

Atlanta, Ga.—City will vote in October on \$100,000 bonds, portion of which will be expended to extend water works in East Lake.

Hopeville, Ga.—Bonds in sum of \$29,000 have been voted for water works improvements.

Shoshone, Idaho.—Citizens have voted to issue \$18,000 bonds to purchase and improve water works.

Galesburg, Ill.—Bonds in sum of \$100,000 for water improvements will be voted on Sept. 15.

Gary, Ind.—Citizens have voted in favor of \$76,000 bond issue for constructing municipal waterworks for Ridge Road Dist.

Carroll, Ia.—Bond issue has been voted for waterworks extension.

Stanton, Ia.—Bids for construction of water works system will be received until 8 p. m., Oct. 1, 1914. Estimate, 3,617 ft. of 6-in. pipe, 6,130 ft. of 4-in., 6,500 ft. of 3-in. pipe, 19 hydrants, 40,000-gal. steel tank and tower, brick pump house, triplex pump, gasoline engine or electric motor. C. G. Carlton is Town Clerk.

Theo. S. De Lay, Creston, Ia., Cons. Engr. **Louisville, Ky.**—Erection of large number of fire hydrants has been ordered.

Louisville, Ky.—Preparations for beginning of work on new storage house for Louisville Water Co., costing about \$35,000, at rear of general offices on Third St., have been completed by Board of Water Works. Contract will be let in a few days.

Plaquemine, La.—Water works bonds in sum of \$42,000 will be voted on Sept. 16.

Lawrence, Mass.—Plan is being considered making it possible for city to acquire new water service without filtration.

New Bedford, Mass.—Petitions have been received for extension of water mains in various streets.

Pittsfield, Mass.—Order has been adopted providing \$5,000 for water extensions.

Saugus, Mass.—Bonds in sum of \$28,000 will be sold for extending and improving water system.

Westfield, Mass.—Water Com. will prepare plans for dam 50 ft. high to impound 300,000,000 gals. of water. John L. Hyde is Town Engr.

Lowell, Mich.—W. J. Sherman Co., Nasby, Toledo, O., will appraise privately owned water works, with idea of purchase by city.

Buhl, Minn.—Proposition of issuing bonds in sum of \$50,000 for improvements to municipal power plant, street paving,

Duluth, Minn.—Plans and specifications for new filter plant have been made.

St. Joseph, Mo.—That St. Joseph would have to pay between \$2,000,000 and \$3,500,000 for its water works if it purchased plant from present company is estimate of Mayor Marshall, who is now working on plan for city acquiring its water plant.

Newark, N. J.—Information concerning suggested purchase of municipal water plant for joint use of Newark, Elizabeth and many other communities in this section of state, has been presented at meeting of Conference on Inter-Urban Improvements of Newark and adjacent municipalities. The conference's water report was especially interesting, in view of hearing to be held at Paterson by State Water Supply Commission upon alternative projects of purchasing East Jersey Water Co.'s Little Falls plant or exploitation of Wanakee watershed. The East Jersey plant has been appraised by state at \$8,728,300, and by company at \$127,700 more. It is proposed that State Commission make purchase and operate plant in interests of different municipalities. It might be possible to procure high level supply from Wanakee for \$3,500,000, and from low level at \$6,000,000, including one pipe to Elizabeth. To purchase figures would have to be added cost of distributing water throughout different municipalities.

Binghamton, N. Y.—Plans are being prepared for new system of water distribution by Nicholas Hill, Jr.

Rochester, N. Y.—In report to Mayor on flood prevention Consulting Engineer Edwin A. Fisher recommends removal of Central Ave. dam and construction of four sections of temporary wooden dams in their place on such plans as may be approved by State Conservation Commission.

Dayton, O.—Plans for laying of water mains for providing service to West Side and Dayton View have been completed and bids for construction of mains will be advertised. These mains will be laid near Fifth St. and Dayton View bridges. Contract will involve only labor, city having arranged to furnish all material for improvement. Total expense of improvement, including material, will total approximately \$30,000.

Greenville, O.—City Council has finally approved plans, profiles, specifications and estimates of cost of proposed filtration and purification plant for Greenville, and has authorized City Solicitor Dershem to draw up ordinance for bond issue of \$79,600 to pay for same.

Lima, O.—City will at once engage a hydraulic engineer of ability and experience to counsel officials as to what ought to be done to strengthen banks of upper reservoir, and as to what measures may be taken to permanently increase water supply of city.

Lima, O.—Improvements to water supply system are urgently recommended by Engineer Walter Sherman, of Toledo.

Pond Creek, Okla.—City Council has passed ordinance authorizing \$7,000 bonds for improvement of water works and electric light plant. F. J. Gentry is Mayor.

Allentown, Pa.—Laying of water mains on various streets has been ordered.

Sykesville, Pa.—State Board of Health has approved of plans for municipal water plant.

Yankton, S. D.—The Northside water works, after having been in the courts for some time, has been sold to city of Yankton for \$400. Purchase gives city complete control of all property of old company, including pipe lines, hydrants, wells and real estate.

Corpus Christi, Tex.—City has voted \$300,000 in bonds to improve water works. Is considering installing pumps, filtration plant and pipe line; capacity, 1,500,000 to 3,000,000 gals. Consulting Engineer is Alex. Potter, 50 Church St., New York.

Cotulla, Tex.—Citizens have voted bond issue for construction of water works.

Denison, Tex.—Five bids on construction of filtration plant for Denison at Randall reservoir have been opened by City Commission. Bid received from the Wm. T. McCormick Co., of Rome, Ga., was not considered owing to absence of certified check. The National Water Filtering Co., of Dallas, bid on mechanical filter of Reiser system for \$12,395. This was for plant alone and city is to construct buildings and concrete foundations. They also bid \$23,355. This bid included labor and material for constructing plant complete including all

buildings and connections to mains. Sub-bid was made by same company to furnish mechanical plant of their own patent for \$17,400. The International Filtering Co. bid \$12,000 for furnishing equipment, city to do foundation work and furnish buildings and connections to plant. The Pittsburgh Filtering Co. bid \$16,200 on furnishing equipment exclusive of buildings and foundation. City to furnish foundations and install same, with buildings. The American Water Softening Co. bid \$12,250 for furnishing and installing equipment, city to furnish buildings and concrete foundations. It will cost city about \$9,000 to construct foundations and buildings for filtration plant and City Engineer Clenny and his men are working out plans for foundations and buildings so that as soon as contract is awarded for plant it can be installed immediately.

Norfolk, Va.—Resolution has been passed, appropriating \$390,000 for acquisition of West Neck creek as additional source of water supply.

Bellaire, W. Va.—Directors of Public Service have been authorized to advertise for bids for replacement of tubes in boilers at Bellaire water works.

Piedmont, W. Va.—Bonds in sum of \$85,000 for improvements to water system will be voted on Sept. 14.

Granite Falls, Wash.—City Council has appointed committee to investigate construction of municipal water works.

Sheboygan, Wis.—Bonds in sum of \$40,000 will be issued for building water works and connecting sewers.

CONTRACTS AWARDED.

Chicago, Ill.—By Board of Local Improvements for laying water supply pipes in various streets to following contractors: Simon Ryan, 2927 W. Congress St.; Tiritilli & Till, Malachy Murphy, 5315 Wabash Ave., and James J. Lynch.

Ottawa, Ill.—For sinking of well to R. H. Green & Sons, Ottawa, at \$11,850.

West Pownal, Me.—By Maine School for Feeble Minded for constructing water system to John E. Palmer, Boston, Mass., at \$25,800.

Attleboro, Mass.—For relining water tank to Bird & Son, of Walpole.

Kansas City, Mo.—To U. S. Cast Iron Pipe & Foundry Co., 520 Security Bldg., St. Louis, for furnishing and delivering f. o. b. cars approximately 1,179 tons c. i. water pipe, 3,000 pcs. 6-in., Class C; 500 pcs. 8-in., 500 pcs. 10-in., and 300 pcs. 12-in. at \$23.50 per ton.

Rochester, N. Y.—Contract for construction of movable dam to be built at Central Ave. bridge has been awarded by Board of Contract and Supply to the T. A. Gillespie Co., 50 Church St., New York, for \$59,600.

Troy, N. Y.—Only bid received Aug. 25 for cleaning of 30,000 ft. of 16-in., and 2,500 ft. of 12-in. water mains was from National Water Main Cleaning Co., of New York City, at 14 cts. per ft.

Portland, Ore.—To Crane & Co., of Portland, Ore., for 40,000 ft. 2-in. galvanized iron pipe at \$10.89 per 100 ft.

Harrisburg, Pa.—For laying 16-in. water pipe under asphalt paving on Front St. to M. F. Saul at \$6,374.80.

Philadelphia, Pa.—Contracts in Bureau of Water have been presented to Director Cooke of Department of Public Works, and approved by Director as follows: Extension at Belmont pumping station, People's Bros., 25th & Callowhill Sts., \$40,000; pump cylinders, Southwark Foundry & Machine Co., 430 Washington Ave., \$1,000; construction of a coal and ash handling plant, R. H. Beaumont & Co., Drexel Bldg., \$13,000; building a shelter house for Queen lane filter plant, McCloskey & Bahl, \$6,500; building a fence around George's Hill reservoir, Berko Bros. & Co., Randolph and Wood Sts., \$2,300; alterations in skylights at Queen lane filter plant, John Boyd, \$823.

Providence, R. I.—For 50,000,000 gal. pump and rope drive engine by Bd. of Contract & Supply to Wm. A. Harris Steam Engine Co. for engine at \$9,470.50, and Providence Steam Eng. Co., for pump at \$3,985.

Bonesteel, S. D.—To Omaha Structural Steel Co., Omaha, Neb., contract for erecting steel tank, at \$1,530.

Parker, S. D.—For extension of municipal water works system to Stanley Edmunds, of Yankton, for \$5,053.

LIGHTING AND POWER

Anderson, Cal.—By vote of 123 to 10 Anderson has voted to establish lighting district that is coextensive with town.

Berkeley, Cal.—Additional light for

southern and western sections of Berkeley will be provided through contract entered into by City Council with Pacific Gas & Electric Co. for installation of University Ave. to Oakland line, and in Shattuck Ave. from Ward St. south to number of gasoliers in Grove St. from town line. Lights are to cost city \$2.50 each month. They will carry metallic signs of streets and red domes for fire alarm boxes.

Petaluma, Cal.—Bonds in sum of \$10,000 for bridge lighting will be voted on Sept. 29.

South Pasadena, Cal.—Plan for street lighting by use of new type of nitrogen lamps is being considered.

La Junta, Colo.—Present lighting company has franchise which expires in about two years. Board of Aldermen will submit to voters at regular election next spring the proposition of issuing bonds to build municipal plant by the time franchise expires. City engineer has been requested to prepare estimates of amount of bonds required. Should election be carried and bonds sold, it is intended to either build or buy present plant some time during next two years. (Correction of item in Sept. 3 issue).

Loveland, Colo.—Bond issue of \$120,000 for municipal lighting system will be voted on Nov. 3.

Bradentown, Fla.—By city, to W. P. Perkins, Tampa, at \$10,000, for construction of 500,000-gal. reinforced concrete reservoir. Phil Lacy is City Engineer.

Ocala, Fla.—Electric light bonds in sum of \$75,000 will be voted on Sept. 14.

Ocala, Fla.—See "Miscellaneous."

Bovill, Ida.—By Village Council, for constructing water works, to C. H. Green, Spokane, Wash., at \$11,000. Geo. C. Egger is Village Clerk.

Prairie Du Rocher, Ill.—For constructing water works and electric light plant, to Monie & Dunbar, at \$18,324.

Waukegan, Ill.—That substitute plans for installation of ornamental lighting system have been prepared and that bids for installation of system will again be received within next few days has been assured by committee in charge of plans of proposed system. Revised plans call for estimating on installation of both cluster and single light arcs.

Fort Wayne, Ind.—Plans are being discussed for erection of ornamental lamps on new St. Joe Boulevard Dike.

Muncie, Ind.—Installation of boulevard lighting system is being considered, estimated cost \$400 a square.

North Vernon, Ind.—City Council has asked John Cass, an electrical engineer of Indianapolis, to draw plans and specifications for contemplated improvements at electric light plant. Council proposes to expend \$10,000 to \$15,000 on improvements.

Aurelia, Ia.—Citizens have voted in favor of bond issue for construction of municipal electric light plant to cost \$7,000.

Carlisle, Ky.—Committee has been appointed by City Council to meet committee of Carlisle Electric Light & Power Co. for purpose of drafting new franchise. A better system of lighting is to be installed and company will also add ice plant.

Battle Creek, Mich.—New bids will be advertised for ornamental lamp standards to be erected on West Main St. and Washington Ave. Recent bids submitted were too high.

Duluth, Minn.—City Council has passed resolution directing Commissioner Merritt, head of division of public utilities, to proceed with construction of municipal electric light plant, first unit, of which will be installed at West Duluth.

Virginia, Minn.—City Council has decided to build gas plant at foot of Spruce St.

Webb City, Mo.—Two plans by which lighting system of city may be changed have been discussed by City Council. Council adjourned until Sept. 14, when the matter probably will be decided. The Empire District Electric Co. made two proposals to Council, both based on ten-year contracts. First proposal is for 50 arc lights of 1,600 c.p. each, in downtown districts, and 100 post arc lights in residence portions of city. Second provides for 16 1,600 c.p. lights on Allen St., 6 of this size being placed near Frisco station, and 50 post arc lights in residence section.

De Witt, Neb.—City Council is discussing plans for establishment of municipal electric light plant to cost \$15,000.

Ewing, Neb.—Council may call election to submit to voters proposal to issue \$18,000 in bonds for municipal electric light plant.

Perth Amboy, N. J.—Erection of a municipal lighting plant will be voted on November 3. Estimated cost \$120,000.

Danville, N. Y.—Plans are being made by Danville Board of Trade for installation of ornamental lighting system on Main St.

Dunkirk, N. Y.—New lighting system is being discussed.

High Point, N. C.—North Carolina Public Service Co. is considering installation of ornamental street lighting system in business district, consisting of 60 standards carrying five 60-watt lamps.

Cincinnati, O.—Installation of ornamental lighting system on sections of Vine St. is being discussed by Central Vine Street Business Association.

Dayton, O.—Ordinance is being considered for issuance of bonds for establishing municipally owned electric light plant.

Urbana, O.—Board of Control has decided to install 5-bulb cluster lights in downtown district.

Youngstown, O.—Better lighting of Falls Ave. is being urged.

Pond Creek, Okla.—City Council has approved of ordinance authorizing \$7,000 bonds for improvements to electric light plant and water works. F. J. Gentry is Mayor.

New Castle, Pa.—Bids for erection of curb lighting system along Washington St. from County Line St. to Greenwood Ave. has been opened. Engineer Millholland estimated that cost would be \$14,920, and from County Line to Shenango bridge at \$11,970. Following propositions were submitted: Gangl-Hartbaug Co., of Akron, O., \$9 for standard lamp. This proposition like all the others made, varies according to the price of different light standards, the commissioners to choose standard they desire. Electric Maintenance Co., of Youngstown, 81 standards from County Line St. to Greenwood Ave., \$9,741; 63 standards from County Line to Shenango bridge, \$7,582. W. H. Ochiltree Co., of Pittsburgh, from County Line to Greenwood, \$11,900; from County Line to Shenango bridge, \$9,743. G. A. Webster Electric Co., of Youngstown, from County Line to Greenwood, \$10,598.95; from County Line to bridge, \$9,448.95. Western Electric Co., of Pittsburgh, for entire work, \$8,519.89. This company offered to have the work completed by November 15.

Philadelphia, Pa.—Citizens of 19th and 43d Wards have adopted resolution urging Councilmen from those wards to use their influence to obtain double-arm light posts on Lehigh Ave. from Lawrence St. to Germantown Ave.

Woonsocket, R. I.—Resolutions have been passed establishing "white way" lights, 30 in all, on North Main St. and in Social district, and providing for lights on Sunnyside and Gaulin Aves.

Walterboro, S. C.—City will vote Oct. 8 on \$15,000 bonds for construction of electric light system.

Sioux Falls, S. D.—Sioux Falls will soon have thoroughly modern and new electric lighting system throughout business district.

Marble Falls, Tex.—City is planning to construct electric light and power plant at cost of \$7,000. R. E. Johnson is Mayor.

Seattle, Wash.—Bid submitted by H. Young, of Seattle, was lowest at \$1,181.90, for water mains on 21st Ave. South, and bid of L. Coluccio at \$8,248.20 for water mains on 47th Ave. N. E.

Spokane, Wash.—City Council has approved ordinance providing for installing and maintaining ornamental street-lighting system on First Ave. for ten years.

Spokane, Wash.—Plans are under consideration for installation of electroliners on Sprague Ave.

Two Rivers, Wis.—Electric Light Commissioners are considering installation of ornamental street lighting system in business section of city.

Montreal, Que.—Board of Commissioners are making surveys for installation of 200 lamp standards. Bids will be called for in near future.

CONTRACTS AWARDED.

Hamtramck, Mich.—By City Council to Peninsular El. Lt. Co. for installation and maintenance of new lighting system on Joseph Campau Ave., from southern village limits to Caniff Road. Incandescent lamps of 100 c.p. will be used, to cost about \$6,500.

Cleveland, O.—For construction of substation on Walworth Ave. for municipal electric light plant to C. N. Griffin Co., of Cleveland, at \$33,700.

Parker, S. D.—By City Council contract for municipal electric light plant to E. M. Fisher & Co., of Fort Dodge, Ia., for \$19,998.

Clarksville, Tex.—By City Council to Clarksville Light Co. for lighting streets of city. Contract calls for 50 lamps to be erected throughout city.

Greggville, W. Va.—By Town contract for installation of electric street lighting system to the Stratford Electric Co.

Woodsdale, W. Va.—By town contract for installation of new street-lighting system to Stratford El. Co. Contract calls for 60 lamps.

FIRE EQUIPMENT

Los Angeles, Cal.—Installation of fire alarm and police telegraph systems is being considered.

Wilmington, Del.—City Council has decided to provide automobiles for two assistant chiefs, thus marking passing of horse from fire department of that city.

Miami, Fla.—An 85-ft. aerial truck, one motor pumper and a tractor for a steamer may be purchased. Casper Hefty is Fire Commissioner.

Athens, Ga.—City will buy motor service truck in a few months. H. H. Gordon is Chairman Fire Committee; Geo. W. McDorman is Chief.

Peru, Ind.—City is planning to purchase motor combination wagon. M. Dowd is Chief.

Shenandoah, Ia.—Chief Frank Sanman and members of Council are considering purchase of motor apparatus.

Haverhill, Mass.—City may decide on purchase of fireboat. J. B. Gordon is Chief.

Taunton, Mass.—Plans will be considered for erection of new fire station on Oak St.

Winthrop, Mass.—Question is being discussed of purchase of motor apparatus.

Kalamazoo, Mich.—Chief Charles H. Russell is urging purchase of four pieces of motor apparatus.

Eveleth, Minn.—In a few months a motor combination chemical and hose wagon and a chief's auto are to be purchased. John Gleason is Mayor and Chairman Fire Committee.

Hannibal, Mo.—City is in the market for an automobile fire truck and would like to hear from manufacturers of same. B. F. Smiley, City Engineer.

Elizabeth, N. J.—City Council will re-advertise for bids for fire apparatus, as contract recently awarded by Board of Fire Commissioners has been declared illegal.

Paterson, N. J.—City is discussing purchase of tractors for four steamers and two motor combination chemical and hose wagons. William Hopson is Fire Commissioner; Thomas Coyle is Chief.

Albany, N. Y.—City is planning to purchase two motor combination chemical and hose wagons. William Erving is Commissioner of Public Safety.

Gloversville, N. Y.—Purchase of motor combination chemical and hose wagon next year is being considered. R. A. Maxson is Chief.

White Plains, N. Y.—The South Side Engine Co. has filed necessary petition with Board of Trustees to have vote taken at next village election on proposition to appropriate sum of \$8,000 for purchase of American La France auto fire engine. The East Side Hose Co. also has proposition which will be submitted for appropriating of \$15,000 to erect new fire house on Warren St.

Devils Lake, N. D.—Purchase of motor combination chemical and hose wagon and chief's auto is under consideration. Dr. W. E. Hocking is Fire Commissioner, and C. O. Russell is Chief.

Canton, O.—Purchase of new supply of hose is contemplated. R. J. Kunkel is Director of Public Safety.

Indiana, Pa.—Fire apparatus bond issue of \$5,000 will be voted on Nov. 3.

Lewisburg, Pa.—The Cameron Fire Co. is considering purchase of motor apparatus.

Shenandoah, Pa.—City is contemplating motorization of entire department. Present horse drawn equipment consists of two steamers, two combination wagons, one hose wagon and a ladder truck. E. J. Rooney is Chairman Fire Committee.

Warren, Pa.—Motor combination chemical and hose wagon may shortly be purchased. J. R. Durham is chairman fire committee.

Woonsocket, R. I.—Entire fire department may be motorized in a few months. Frank Girard is Chairman Fire Committee, and A. J. Cote is Chief.

Burlington, Vt.—Purchase of new 6-circuit repeater at fire station to cost \$1,500 is recommended.

Puyallup, Wash.—At election in December a \$10,000 bond issue for fire equipment will be voted on.

Eau Claire, Wis.—Purchase of motor hose wagon is being considered. James Walsh is Chief.

Rhineland, Wis.—Appropriation is being discussed for purchase of motor combination chemical and hose wagon. A. D. Sutton is Fire Commissioner.

Ottawa, Ont.—Tractors for engine and ladder truck will be purchased in a few months. Napoleon Champagne is Chairman Fire Committee.

CONTRACTS AWARDED.

Fresno, Cal.—To Front Drive Motor Co., of Hoboken, N. J., for Christie tractor for steamer.

Wilber, Neb.—To Eureka Fire Hose Mfg. Co., New York City, through its Kansas City office, for 1,000 ft. of Paragon hose.

Elric, Pa.—Mayor Stern has been authorized by Council to enter into contract with American-LaFrance Co., Elmira, N. Y., for purchase of \$12,000 aerial fire truck for local department.

Lebanon, Pa.—By City Council, the \$2,900 hose contract to C. C. C. Co., Boston, Mass.

Lewistown, Pa.—To Fabric Fire Hose Co., of New York, contract for 500 ft. of patrol Fabric hose. Local agent is G. T. Lyter.

New Brighton, Pa.—To Fabric Fire Hose Co., New York City, contract for 600 ft. of hose.

BRIDGES

Marysville, Cal.—Nine contractors have submitted bids before Board of Supervisors on construction of proposed new D St. bridge over Yuba River at this point, which is to be reinforced concrete structure. Bids were as follows: Leech & De Camp, San Francisco, \$211,700; Shattuck, Edinger Co., San Francisco, \$187,500; Ross Construction Co., Sacramento, \$166,720; Van Sant, Houghton Co., San Francisco, \$163,000; E. Rolandi, San Francisco, \$155,000; Mathews Construction Co., Sacramento, \$149,500; I. C. Evans, Marysville, \$148,680; F. A. Koettl, \$138,895; Clinton Fireproofing Co., San Francisco, \$134,000. Bids were taken under advisement. Bids have also been opened for construction of reinforced concrete bridge over Honcut Creek at Mahle Crossing, between Yuba and Butte Counties, four miles east of Honcut. Figures were as follows: F. D. Groh & Son, Marysville, \$7,800; Chico Construction Co., Chico, \$4,770; Jenkin & Holmes, Chico, \$3,875. These bids are also taken under advisement.

Orange, Cal.—Bridge bonds in sum of \$10,000 will be sold for construction of city's share of proposed concrete bridge across Santiago Creek on East Chapman St.

Morgan, Ga.—Calhoun County will vote Sept. 26 on \$100,000 bonds for construction of bridges and roads. Z. T. Rabun is chairman of board.

Indianapolis, Ind.—Board of County Commissioners, in its annual budget, asks that County Council appropriate \$70,000 for proposed Shriver Ave. bridge.

New Castle, Ind.—Ten thousand dollars has been set aside for repairs of bridges during coming year. Amount to be spent for new bridges is \$24,350. This includes following bridges: Stratton bridge, over Blue River, \$3,600; bridge near Morris farm, on Greensboro and Knightstown pike, \$950; concrete bridge on National pike near Dublin, over Symons Creek, \$4,000; girder bridge over Bell Creek at Swank farm, \$3,000; bridge over Bell Creek at Sanders school, \$2,600; bridge over Buck Creek near Luray, \$2,700; bridge over Blue River, southwest of Newcastle, \$7,500.

Richmond, Ind.—An appeal will be made by members of South Side Improvement Association to County Council for county to begin construction of bridge across Whitewater River south of present Main St. bridge. There are three sites under consideration by county, one at South L St., one at South E St. and one at South H St. Estimate on South L St. site is \$100,000. The South H St. site will cost approximately \$150,000, and South E St. site will cost about \$120,000, according to estimates.

Duluth, Minn.—Ordinance has been adopted to appropriate from permanent improvement fund sum of \$500 for construction of concrete bridge over Tischer's Creek at Oxford St. C. S. Palmer is City Clerk.

St. Louis, Mo.—Bond issue of \$2,750,000 for five bridges will be voted on Nov. 6.

Bozeman, Mont.—Commissioners of Gallatin County have ordered plans prepared by Fred F. Wilson & Co., Boze-

man, for construction of two bridges, one across Baker Creek and one over Gallatin River, near Manhattan.

Plainfield, N. J.—Street committee has been authorized to advertise for bids for completion of West End Ave. viaduct.

Cincinnati, O.—Plans have been approved by Board of Commissioners of Hamilton County for construction of bridge over Mill Creek at Wayne Ave. at cost of about \$51,290.

Sapulpa, Okla.—Tiger Township will vote Sept. 22 on \$27,000 bonds for erection of bridge over Cimarron River. M. E. Sanders is pres. Board Directors.

Woonsocket, R. I.—City Engineer Mills has presented his estimate, showing that new concrete bridge on East School St. over Mill River would cost \$8,000 with \$2,000 more for widening of highway at that point.

Knoxville, Tenn.—It has been voted to build steel bridge across Bull Run Creek to cost approximately \$800.

Fort Worth, Tex.—With view of improving conditions at Ten-Mile bridge commissioners have procured plans and specifications for another structure 30 ft. long to span lowlands and connect therewith. Estimated cost is \$5,524.

Tacoma, Wash.—It is practically assured that most of work on proposed Buckley Bridge will be done by King and Pierce Counties. Commissioners of two counties have asked structural steel companies in East to submit bids for furnishing of steel for bridge. Bids are to be opened in January. Estimated cost of entire structure is \$45,000.

CONTRACTS AWARDED.

Tampa, Fla.—By County Commissioners, to Edwards Construction Co., of this city, for construction of number of small bridges and culverts on county roads throughout county.

Tampa, Fla.—By County Commissioners for constructing concrete bridges throughout county to W. P. Kennedy, Pensacola, Fla., \$11,348, including hand rails.

Boise, Idaho.—For constructing bridge over Snake River for county to Security Bridge Co., Minneapolis, Minn., at \$36,115.

Waukegan, Ill.—For construction of Oak Springs bridge and Haven culvert, to John Darrow, of Waukegan, at \$5,340.

Petersburg, Ind.—To Vincennes Bridge Co., contract to build 13 bridges in Pike County for sum of \$7,393 from Board of Pike County Commissioners.

Elkader, Ia.—By County for constructing bridges and culverts to following contractors: Paul N. Kingsley, Strawberry Point, \$19,335; C. E. Walker, Calamus, \$6,834; A. P. Schweikert, Elkader, \$3,533; C. H. Williamson, Elkader, \$2,345.

Baltimore, Md.—For constructing concrete bridge with 430 ft. spans over North Branch Patapsco River to Thomas, Poole & Hunt, at \$3,175.

Baltimore, Md.—To J. T. Gorsuch Construction Co., 131 Law Building, at \$40,000, to construct concrete bridge 163 ft. long at Gunpowder Falls.

Lawrence, Mass.—The Essex County Commission has awarded to Merrimack Construction Co., of Lawrence, contract to build new concrete bridge over Shawheen River on Merrimack St., this city, and also to erect retaining wall along river and widen street. Bid was lowest of eight submitted, being \$15,630. Work must be completed before first of next January. Other proposals received were: W. M. Pike & Sons, of Lawrence, \$16,975.50; T. Stuart, of Newton, \$17,076.25; William H. Callahan, Lawrence, \$19,590; J. W. Buswell, of Salisbury, \$20,305; John Cashman & Sons Co., of Boston, \$21,495; M. O'Mahoney Estate, Lawrence, \$23,485; Timothy Minahan, of South Hamilton, \$25,992.50.

Flint, Mich.—Contract for construction of new bridge over Thread Creek, on West Court St., has been awarded by Common Council to Illinois Bridge Co., 53 W. Jackson Blvd., Chicago. Bid of this company was \$10,286 exclusive of cost of cement, which will bring total cost to about \$14,000. Cement is to be furnished by city. Bridge will be of concrete arch construction.

Binghamton, N. Y.—The Binghamton Bridge Co. has been awarded contract for new steel bridge to span Page Brook at North Fenton at \$2,075.

Buffalo, N. Y.—By State Supt. Pub. Wks., Albany, for constructing steel and concrete highway bridge over Mohawk River at Movable Dam No. 5, near Rotterdam, to Lupper & Renwick, Ellicott Sq. Bldg., at about \$45,000.

Delaware, O.—Contracts for construction of two bridges in Delaware County have been let by Delaware County Commissioners to Bellefontaine Bridge &

Steel Co., of Bellefontaine, O. Bridges are known as Home and Mulzer bridges, former being located in Liberty Township, and latter east of Powell on Powell road. Amount of bid on Home bridge is \$9,620.74, and for Mulzer bridge is \$7,835.17.

Massillon, O.—Eleven bids have been received on substructure of new viaduct which is to cross Tuscarawas River, Ohio Canal, W. & L. E. and B. & O. railroads, connecting Pigeon Run Road with South Erie St., and five on superstructure. S. C. Kistner & Sons, of Delaware, were lowest bidder on substructure. Amount of their bid was \$24,285.50. The Riverside Bridge Co., of Martins Ferry, was lowest bidder on superstructure. Its bid was \$16,422.20, making \$40,807.70, total cost of erecting 900 ft. bridge.

Tiffin, O.—To A. Shekelhoff & Son, of Fremont, for construction of Riverview Park bridge No. 341 at \$1,527.14 and for grading approaches \$1,027.50.

Bloomington, Pa.—By County Comrs. to John Gorey, Bloomington, for constructing double span plate girder bridge with concrete floors and back walls over Fishingcreek, Crane Township, at about \$4,850.

Glenside, Pa.—For constructing bridge for Montgomery County to John Wolf, Glenside, at about \$10,000.

Meyersdale, Pa.—For erecting stone arch bridge over Plougherty Creek, to Frank H. Zeigler, Somerset, at \$10,790. L. Phillips is Clerk County Commissioners.

Pittsburgh, Pa.—For constructing reinforced concrete elliptical arch over Gourhead Run, Hampton Township, 1/2 mile from Allison Park Station, to Duquesne Contr. Co., Bessemer Bldg., Pittsburgh, at \$6,837.

Ritzville, Wash.—For constructing 4 steel and concrete bridges, to Charles G. Huber, Central Bridge Building, Seattle, at about \$14,000.

MISCELLANEOUS

Los Angeles, Cal.—Installation of police & fire alarm telegraph systems is being considered.

Petaluma, Cal.—Bonds in sum of \$45,000 for improvement of Thompson Creek will be voted on Sept. 29.

Santa Barbara, Cal.—County bond issue of \$1,000,000 is planned to be voted in near future, for construction of county hospital, detention home and comprehensive road system.

San Francisco, Cal.—Bond issue of \$1,250,000 for State Building will be voted on Nov. 3.

Washington, D. C.—Bids will be received until 2 p.m., Oct. 15, for collection and disposal of garbage, etc.

Marianna, Fla.—Bond issue of \$56,000 for municipal improvements will be voted on Oct. 20.

Ocala, Fla.—At meeting of City Council ordinance was passed calling for bond elections on October 27 and 28. Sums needed and purposes they are needed for are as follows: At election of Oct. for sewerage, \$100,000; for paving, \$100,000; for new public buildings, \$50,000; for new electric plant and municipal ice plant, \$55,000. At election of Oct. 28: For enlarging water plant, \$75,000.

West Palm Beach, Fla.—Improvement bonds in sum of \$100,000 will be voted on Sept. 21.

Clarinda, Ia.—Bond issue of \$25,000 for County Home Building will be voted on Nov. 4.

Keokuk, Ia.—Plans for improving river front by construction of freight terminals, etc., are being discussed.

Lancaster, Ky.—Court House bond issue of \$15,000 will be voted on Nov. 3.

Iron Mountain, Mich.—Installation of incinerator plant to cost about \$4,000 is being discussed.

Haverhill, Mass.—Plans have been made for extension of seawall next season.

Pittsfield, Mass.—Order has been adopted providing \$900 for purchase of Buick automobile for police department.

Duluth, Minn.—In order to finance construction of two large county ditch projects and building of 32-mile stretch of county's portion of Duluth-St. Vincent Road, St. Louis Co. will borrow \$293,500 from state. Three state loans, one for \$150,000, another for \$100,000 and the third for \$43,500, will be applied for, according to action taken by County Board. Ditch projects for which loans will be asked are known as County Ditch No. 1 and No. 2, and are now well under way. County Ditch No. 1, for which county ditch bonds in sum of \$100,000 will be issued, is now under construction between Kelsey and Zim. It will be 66 1/2 miles in length and will drain 24,000 acres of land which will make excellent farms. County Ditch No.

2 is project in Meadowlands district which will drain between 7,000 and 8,000 acres of agricultural land between the Whiteface and St. Louis Rivers. About 20 miles of good road will be built on the waste banks of Ditch No. 2.

Duluth, Minn.—Ordinance has been passed providing for issuance, form and sale of bonds in sum of \$16,000, for purpose of acquiring site for armory for National Guard.

Hibbing, Minn.—Installation of garbage incinerator is being discussed.

Omaha, Neb.—City jail bonds of \$100,000 for erection of new city jail have been recommended by Council in committee of whole.

Newark, N. J.—Bids have been received by Board of Works for construction of new city stables on site of old almshouse property in Elizabeth Ave. Lowest bidder was Edward M. Waldron, Inc., \$180,000. There were seven other bidders, as follows: William G. Sharwell & Co., \$186,965; Philip L. Mackinson, \$192,500; E. M. Waldron & Co., \$193,906; Frederick Fatzler & Co., Inc., \$199,195; Essex Construction Co., \$202,247; Alexander Domerky, \$211,998. No action was taken on awarding of contract. Bond issue proposed called for \$150,000, but board will receive \$55,000 from Board of Education for site of old stables at 8th Ave. and Factory St., which will enable board to proceed on figures obtained.

Rochester, N. Y.—Following first ordinances have been presented and referred to proper committees: Additional lighting of Fitzhugh St., estimated expense, \$1,003.75; Locust St. pavement, \$7,000; Pinnacle St. extension, \$5,000; Bradley St. pavement, \$4,000; Lang St. pavement, \$6,000; Garson Ave. walks, grading and sewer, \$8,700; Parsells Ave. extension; Thurston Road sanitary sewer, \$3,900; Acorn and Pioneer Sts. sewers, \$2,300. Following final ordinances have been adopted: Atkinson St. walks, Plymouth Ave. to Ford St., \$800; Knickerbocker Ave., Summit Grove Park and Aster St. extension, \$1,500; Pinnacle Road sewer, \$700; Grand Ave. sewer, walks and grading, \$3,500; Bedford St. sewer, walks and grading, \$10,200; Lockwood St. opening, \$1; Denise St. opening, \$1; Duke St. extension, Breden St. extension, \$1; Genesee Park Boulevard walks, \$1,300; Scottsville Road walks, \$1,300; Genesee St. sewer, \$3,000; Atlantic Ave. sanitary sewer, \$27,000; Pomeroy St. pavement, \$10,000; Wilkins St. Pavement, \$9,500; Gerald St. extension, \$1,000; Nicholas St. extension, \$1,000; Clairmont St. extension, \$8,000; Calahan Park walks, \$150.

Trenton, N. J.—Ordinance has been adopted to authorize issuance of bonds for purchase of lands for use as public park.

New York City, N. Y.—A site for new free market on north side of 67th St. and Central Park has been offered to Borough President Marks, and it is probable, if arrangements are satisfactory, city will have ninth municipal market, to be known as Fifth Avenue Market.

Niagara Falls, N. Y.—City Hall bonds in sum of \$390,000 will be voted on Sept. 15.

Troy, N. Y.—All bids received for disposing of garbage have been rejected. City is negotiating with Bartlett-Snow Co., of Cleveland, which has submitted proposition to dispose of garbage by patent process without cost to city, offering also to construct disposal plant.

Hamilton, O.—Question of installing garbage incinerator is being discussed.

Allentown, Pa.—Bids will shortly be advertised for new motor-driven police patrol.

Hazleton, Pa.—Appropriation will be made for purchase of small gasoline hoisting engine for stone crushing plant.

Philadelphia, Pa.—Preliminary to meeting of the Finance Committee, sub-committee on appropriations has tentatively decided to report loan bill for \$11,500,000. As soon as general committee makes its report, call will be issued for special session of both branches of Councils to authorize advertising of intent to submit subject of increased indebtedness to voters at election on November 3. Present apportionment, which is subject to change, is as follows: Parkway, \$1,000,000; park improvements, \$1,000,000; removal South Philadelphia grade crossings, \$1,000,000; northeast grade crossings, \$500,000; art gallery, \$1,000,000; transit development, \$1,000,000; water system, \$1,000,000; mandamus, \$900,000; highway improvements, \$800,000; parks, \$500,000; county prisons, \$400,000; sewers, main and branch, \$900,000; police and fire stations, \$300,000; bridges, \$200,000; widening Delaware Ave., \$200,000; recreation centres, \$100,000; Philadelphia Hospital, \$700,000. Total \$11,500,000.

Philadelphia, Pa.—Bids are to be received until Oct. 16 for disposal of garbage.

Pittsburgh, Pa.—Council has decided to erect six comfort stations at cost of \$90,000.

Newport, R. I.—It is understood that petitions are soon to be circulated asking Council for appropriation for garbage incinerator.

Woonsocket, R. I.—Finance committee has submitted estimates of City Engineer Mills for cost of comfort station on Court St., near Main, which approximate \$15,000.

Milbank, S. D.—Court House bond issue of \$75,000 will be voted on Nov. 3.

Knoxville, Tenn.—Purchase of automobile for use of county engineer is being considered.

Dallas, Tex.—Construction of barns by Park Board at cost of \$20,000 is being planned.

Seattle, Wash.—Bond issue of \$300,000 for County Building (city's portion) will be voted on Nov. 3.

Huntington, W. Va.—Municipal improvement bonds in sum of \$695,000 will be voted on Sept. 19.

CONTRACTS AWARDED.

San Francisco, Cal.—By Board of State Harbor Commissioners contract for construction of pier 37 to Healy-Tibbitts Construction Co., of San Francisco, at \$204,300, lowest of five bids received.

Indianapolis, Ind.—To Union Engineering Co. for concrete wading pool in Morris Park, Brightwood.

Oberlin, La.—To Berdon-Campbell Furniture Co., of Lake Charles, has been awarded contract for furnishing new Allen parish court house at Oberlin. Bid was \$6,050.

Long Branch, N. J.—Contract for abutment wall for bridge on road from Tenant to Manalapan to Ambrose, Matthews & Thompson, of Red Bank, on their bid of \$873.

Lockport, N. Y.—By Water Board to Dilts Machine Works, of Fulton, N. Y., contract for host gates for new tunnel under City Hall on his bid of \$950.

Rochester, N. Y.—Following contracts have been awarded: Driving Park Ave. sewer, W. E. Kinney & Co., \$1,706.25; Main St. East sanitary sewer, R. T. Ford Co., \$5,829.75; sewer, walks and grading in Ella St., Passero & Petrossi, \$3,528.20; sewer, walks and grading, Penhurst St., John Petrossi, \$6,410.50; Monroe Ave. walks, F. Crouch, \$1,158.75; sewer in Lehigh Ave., Passero & Petrossi, \$3,937.50; walks and grading in Ringle Place, Oliver Costich, \$506.75; walks and grading in Hillside Ave., Genesee Contracting Co., \$2,052; walks in Clifford Ave., Oliver Costich, \$2,560.50; sewer in Norton St., Frank Lackiuso, \$1,771.50; walks in Humboldt St., Frank V. Brotsch, \$590.50; asphalt pavement in Magee Ave., F. V. Brotsch, \$18,471; Meigs St. brick pavement, Ribstein-Holter, \$2,111.80; plumbing in administration building at Hemlock Lake, Howe & Bassett, \$1,570; heating for administration building at Hemlock Lake, Robert Calder, \$400.

Schenectady, N. Y.—To Standard Oil Company, New York City, for 8,000 gallons of gasoline for garbage reduction plant at 13.97 cts. per gallon, or \$1,117.60 for whole amount.

Springfield, O.—Bids have been opened for erection of county memorial building, and lowest bid for general contract was submitted by King Lumber Co., of Charlottesville, Va., at \$207,419.

Astoria, Ore.—To Charles L. Houston, a local contractor, contract for erection of superstructure of big municipal dock at Taylor's, Astoria. His bid was the lowest of seven received and was for \$128,352.

Eugene, Ore.—By Water Board contract to C. H. Mahany, of this city, at \$398.98, to build concrete covering for city well across river from pumping plant. The covering will be 14 ft. across, 28 ft. long and 7 ft. high, and will be of arch type.

South Bethlehem, Pa.—For cement to be used by city in repair of paved streets to General Supply Co., York, Pa., at \$1.45 per bbl.

Charleston, S. C.—Contract for building public wharf at foot of Tradd St. has been awarded to Simons-Mayrant for sum of \$4,758.

Amarillo, Tex.—For cement work at new fire station on 16th St., to Wilmering & Mullen.

Dallas, Tex.—By City Park Board contract for erection of neighborhood house in Summit Play Park to S. S. Self. Building complete will cost \$21,920.

Seattle, Wash.—By Board of Public Works, contract for cast steel nozzles, to Washington Iron Works, Seattle, Wash., at \$690.